

FIGURE 1A

CTCAGGACAGT GACCTGGAGTGAGTACAAGGTGAGGCCACCACTCAGGGT
GCCAGCTCCAAGCGGGTCAACGGGACGAGGGCTGCGGCCATCAGGAGGCCCT
GCACACACATCTGGGACACGCGCCCCGAGGGCCAGTTCACCTCAGTGCGCCT
CATTTCTCTGCAAAAAGCGCCCCCATCCTTTCTTACAAGGCTTTCTGTGAAG
CAGAGGCGTCGATGCCAGTACCCTCTCCCTTTCCCAGGCAACGGGACCCCAA
GTTTGCTGACTGGGACCACCAAGCCACGCATGCGTCAAGAGTGAGAGTCCGG
GACCTAGGCAGGGGCCCTGGGGTTGGGCCTGAGAGAGAAGAGAACCTCCCC
AGCACTCGGTGTGCATCGGTAGTGAAGGAGCCTCACCTGACCCCGCTGTTGC
TCAATCGACTTCCCAAGAACAGAGAGAAAAGGGAAGTTCCAGGGCGGCCCGG
GCCTCCTGGGGGTTCCCAACCCATTTTTAGCTGAAAGCACTGAGGCAGAGCTC
CCCCTACCCAGGCTCCACTGCCCCGGCACAGAAATAACAACCACGGTACTGAT
CATCTGGGAGCTGTCCAGGAATTC

Germiline & Locus

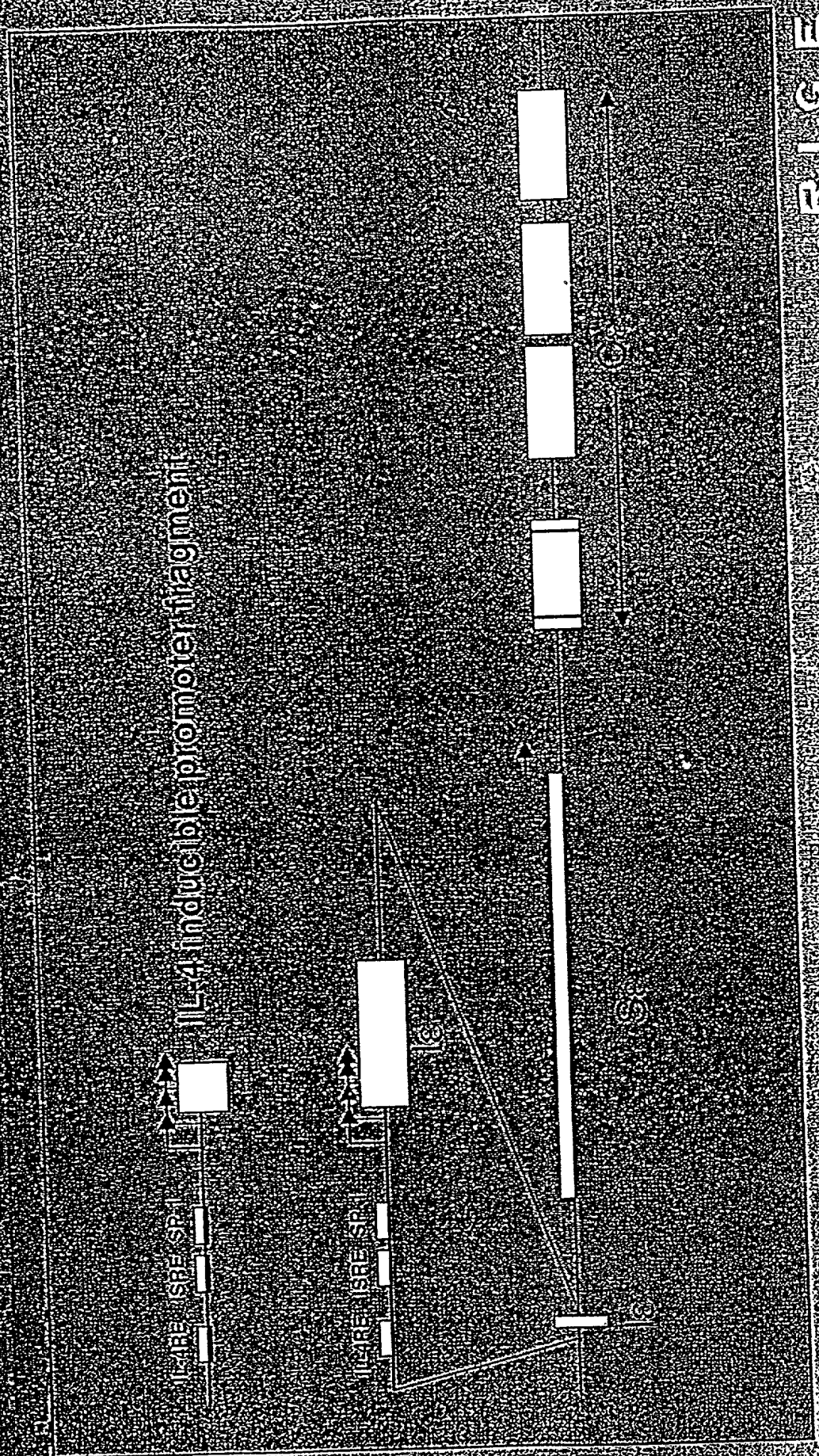


FIGURE 1B

Low energy DNA folding of the S_{ϵ} region

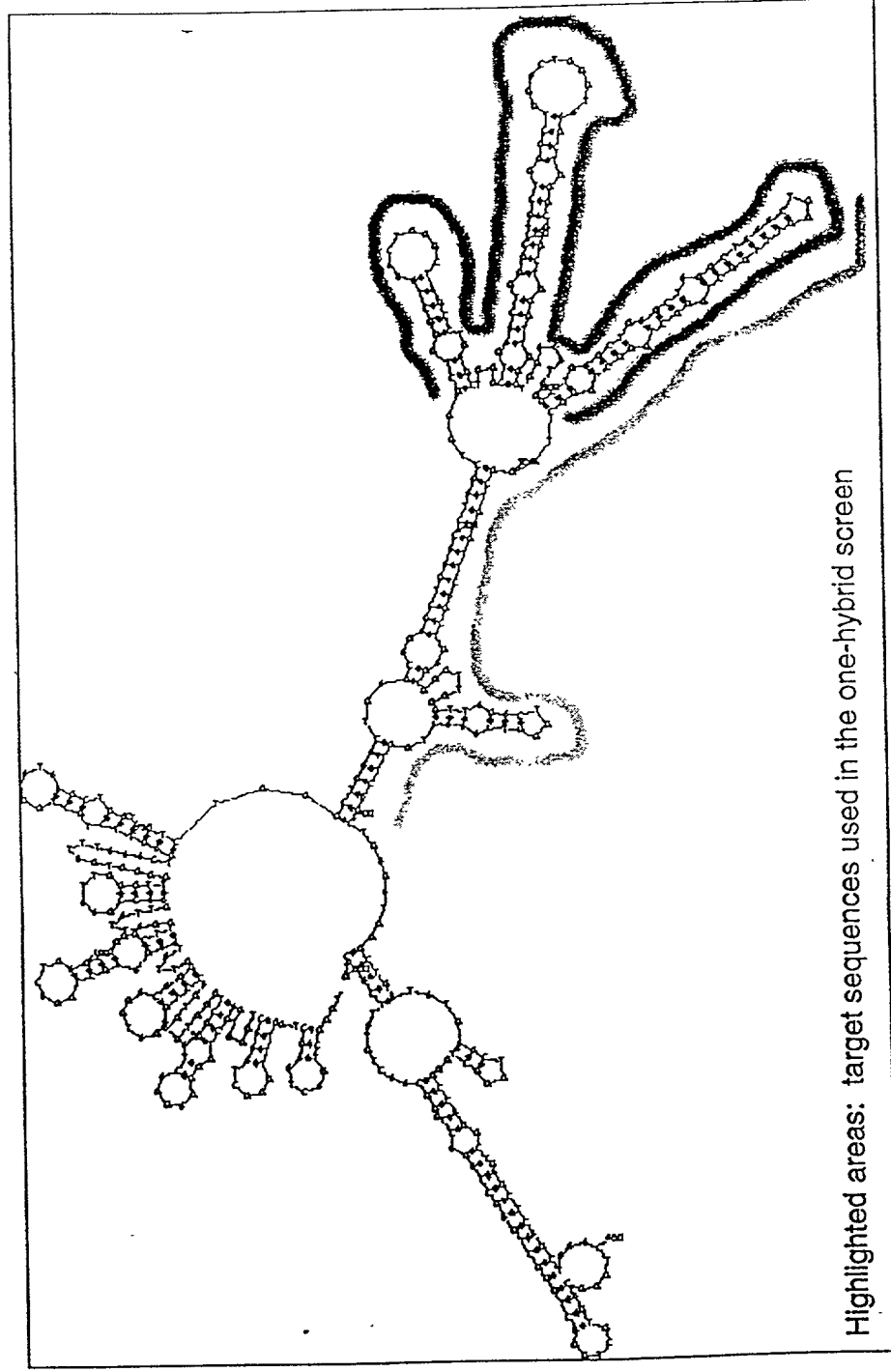


FIG 2A

FIGURE 2B

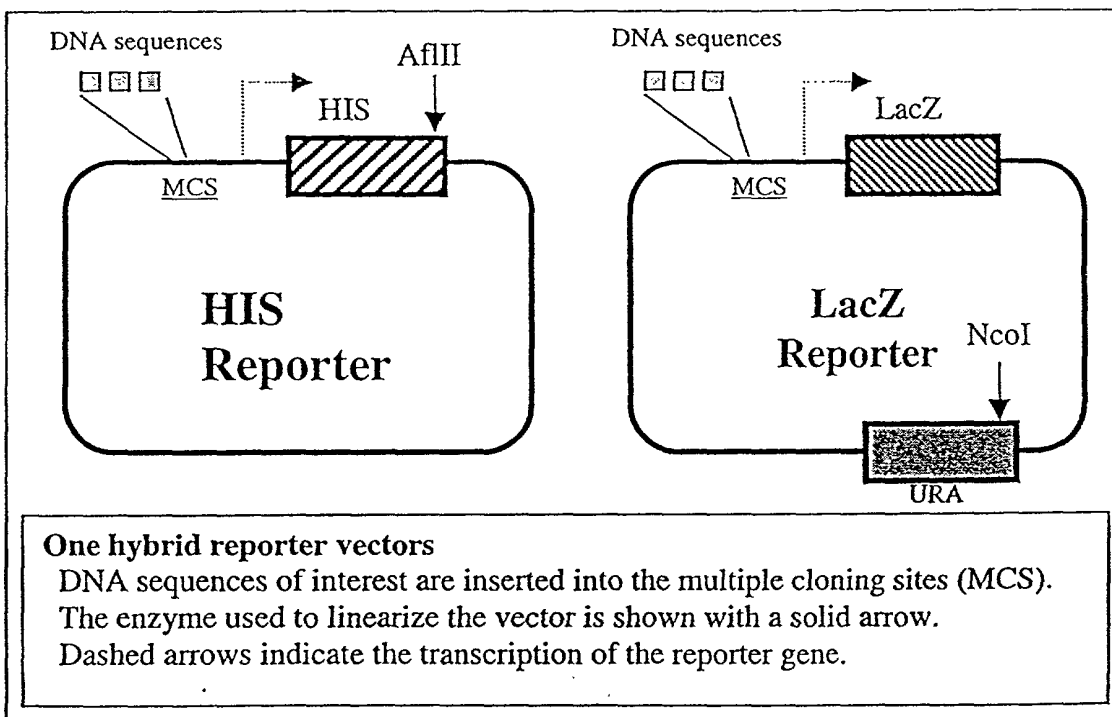
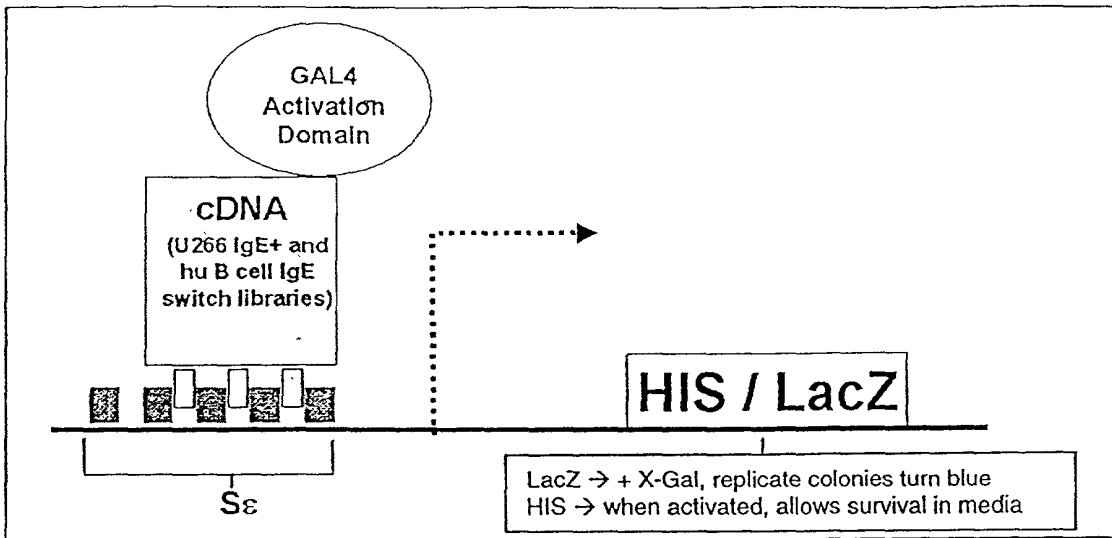
1 GCTGGGCTAA ACTGGGCTAG CCTGAGCTGG GCTGAACTGG GCTGCTGGGC
51 TGGACTGGGT AAGCTGGGCT GAGCTGGGTT GGGTGGAAAT GGGCTGAGCT
101 GAGCTAGGCT AACTGGGTT TGGCTGGGCT GGGCTGGGCT GGG

FIGURE 2C

1 GGTTTGGCTG GGCTGGGCTG GGCTGGGCTG GGTCAGCTG AGCGGGTTGG
51 GTTAGACTGG GTCAAACCTGG TTCAGC

FIG 3

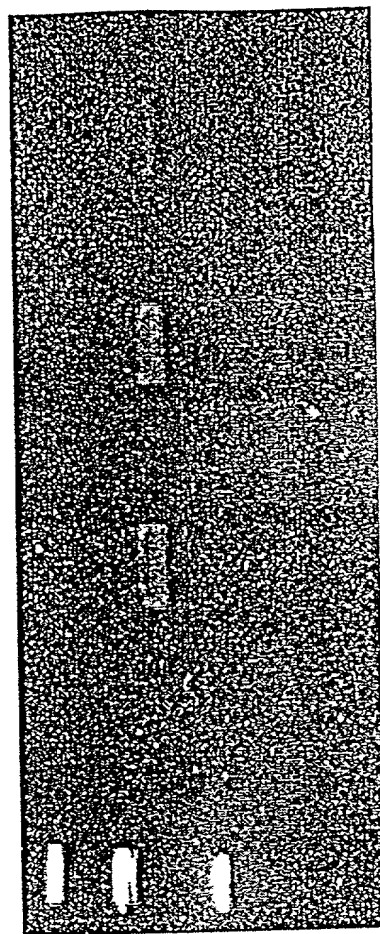
Appendix F Yeast One-Hybrid Screening



IL-4 Induction of Germline ϵ mRNA in the IgM+ B cell lines: CA-46, MC-116 and DND39

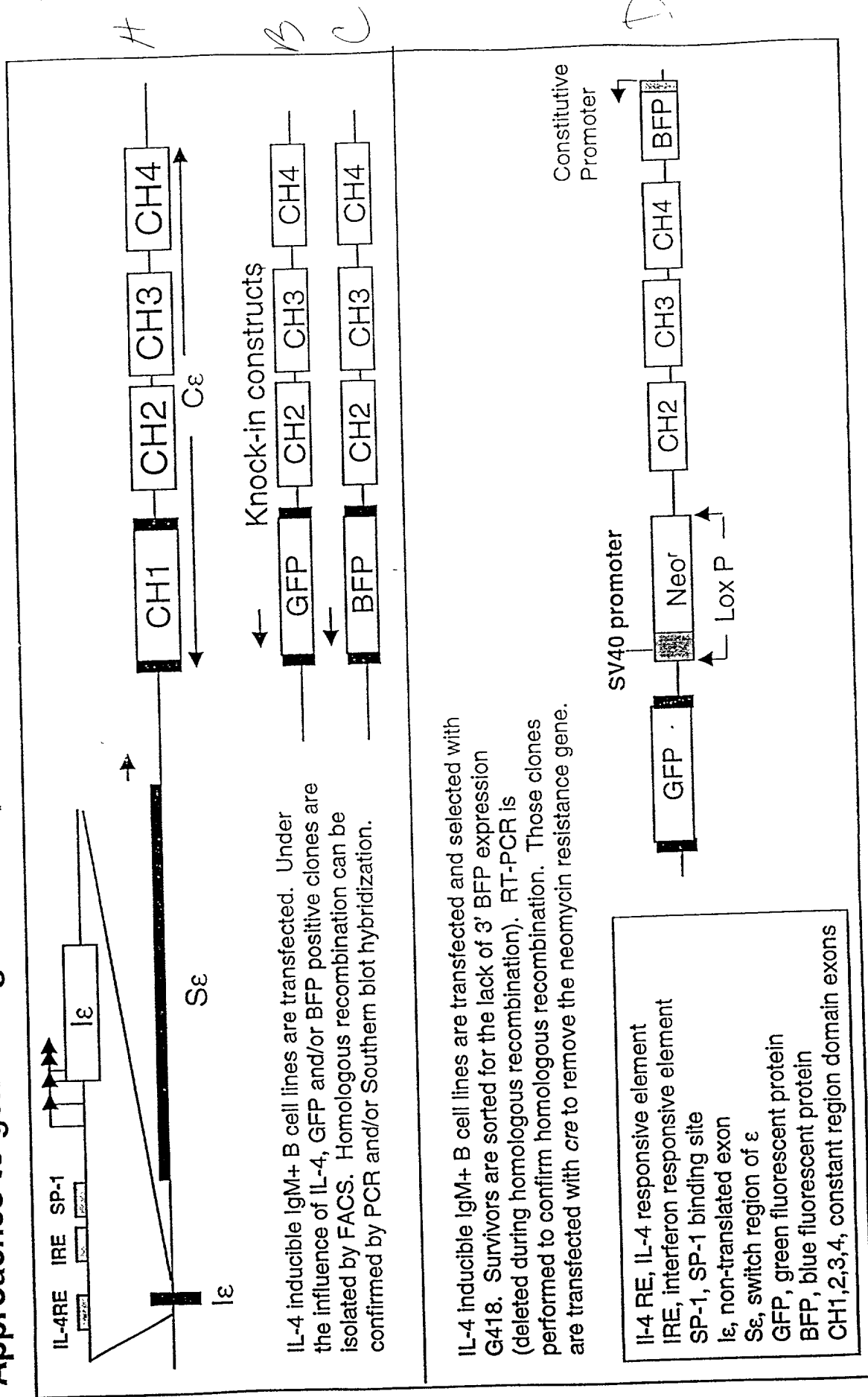
Cells were incubated for 48 hrs in 300 U/ml of h-IL-4. RT-PCR was performed using primers specific for the germline ϵ exon and the 5'-end of the ϵ CH1 exon (predicted size ~ 200 bp).

DND39 + IL-4
DND39 - IL-4
MC-116 + IL-4
MC-116 - IL-4
CA-46 + IL-4
CA-46 - IL-4
Neg cont.



246 bp
123 bp

Approaches to generate germline ϵ promoter knock-in reporter cell lines

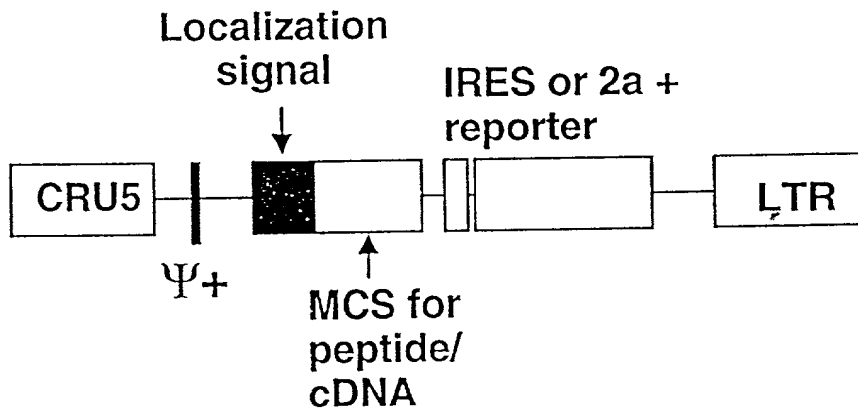


Appendix A

FIG 6

Appendix I

Rigel Base Vector



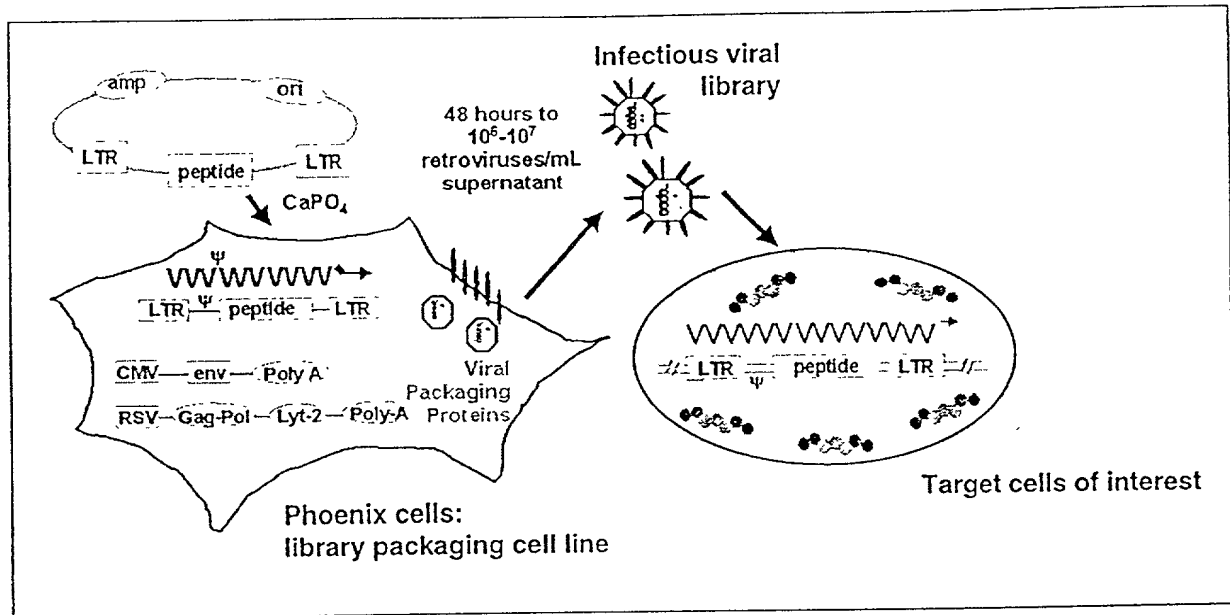
All components are cassetted for flexibility

CRU5, modified LTR
LTR, long terminal repeat
Ψ+, packaging signal
Localization signal: nuclear, cell membrane, granular
MCS, multiple cloning site
IRES, internal ribosome entry site
2a, self-cleaving peptide

FIG 7

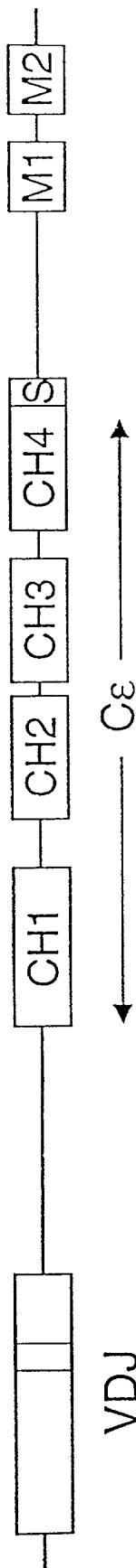
Appendix H

Protocol for Transfection of Phoenix Cells and Infection of Nonadherent Target Cells

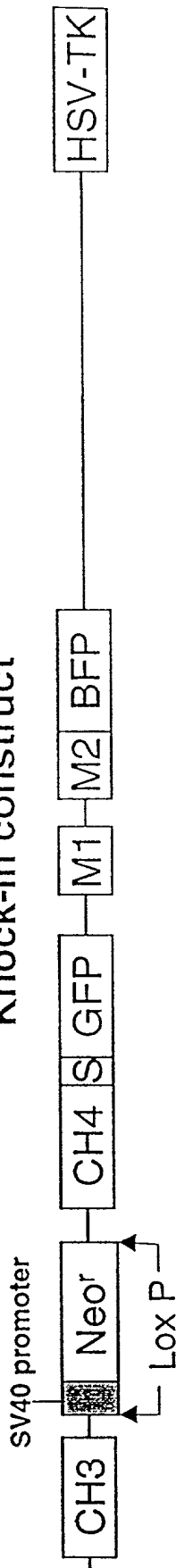


ϵ heavy chain GFP/BFP knock-in cell line

U266 ϵ heavy chain



Knock-in construct



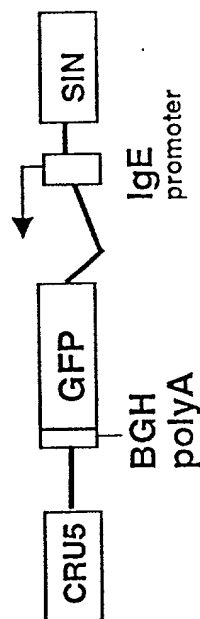
U266 cells are transfected and selected with G418. Survivors are treated with ganciclovir (HSV-TK deleted during homologous recombination). RT-PCR is performed to confirm homologous recombination. Those clones are transfected with *cre* to remove the SV40 neomycin resistance gene.

S, secretory exon
 GFP, green fluorescent protein
 BFP, blue fluorescent protein
 Neo^r, neomycin resistance gene
 VDJ, V region exon
 CH1,2,3,4, constant region domain exons
 M1, M2, membrane exons
 HSV-TK, Herpes Simplex virus-Thymidine Kinase

Appendix D

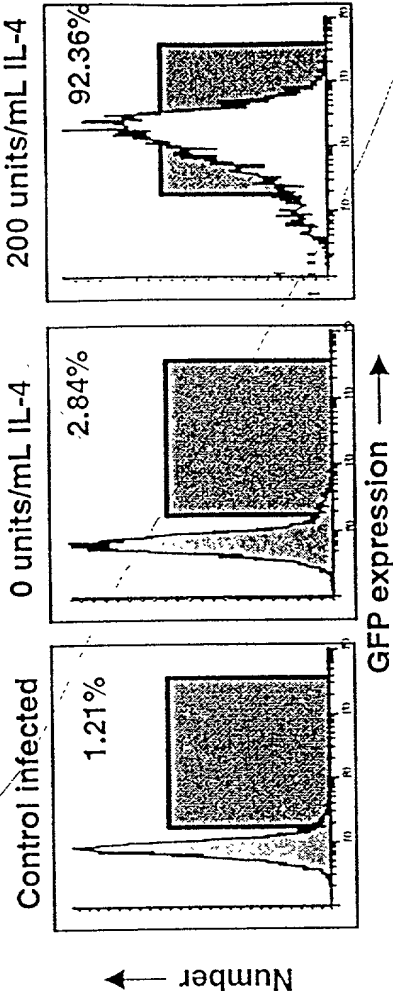
IL-4 Inducible ε Promoter Reporter Cell Line

Reporter construct



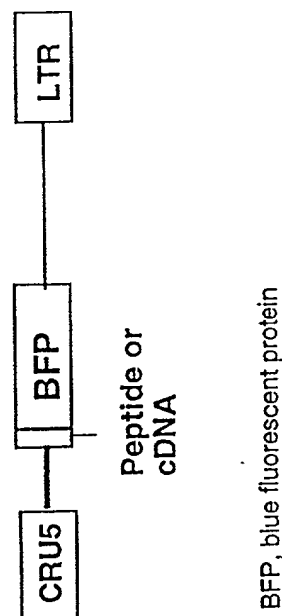
CRU5, hCMV promoter plus R and U5 regions of LTR
 GFP, green fluorescent protein
 BGH poly A, bovine growth hormone poly-adenylation signal
 SIN, self-inactivating LTR

IL-4 induced reporter

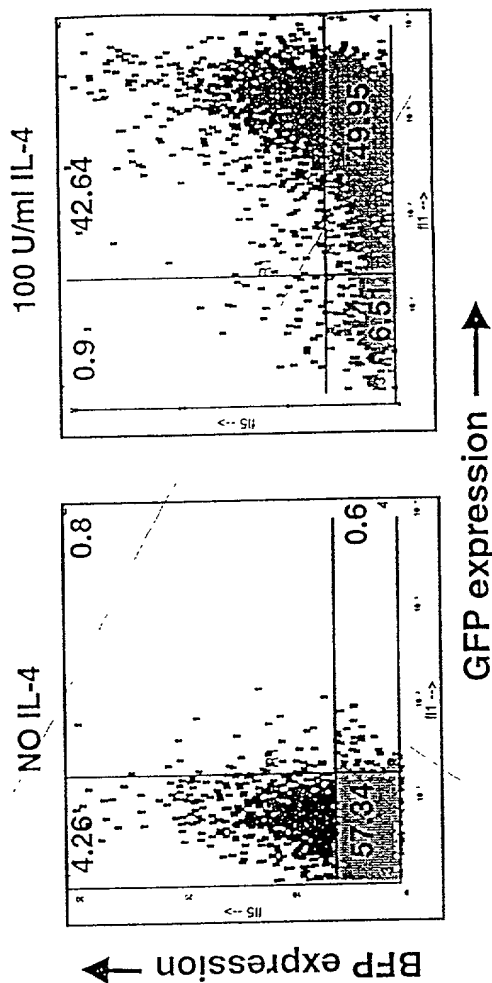


Reporter Line Infected with BFP Construct

Library construct

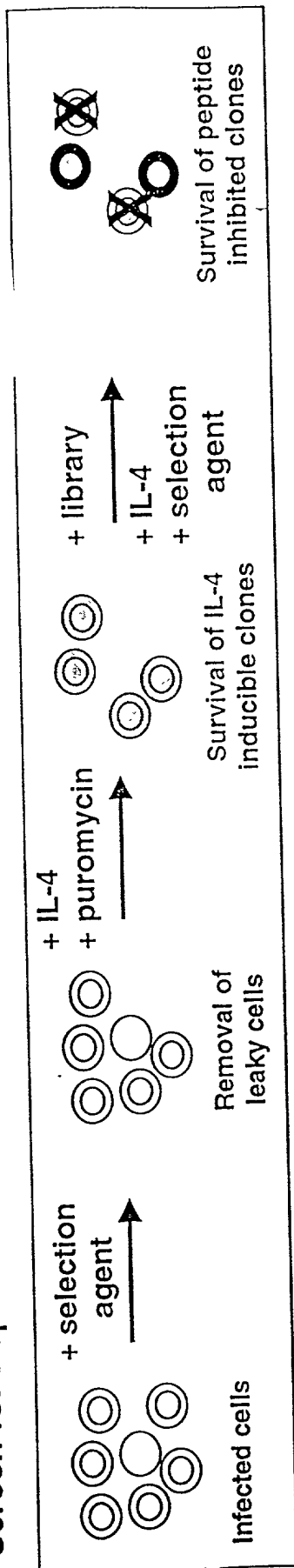


FACS profile of cells with both reporter and peptide library

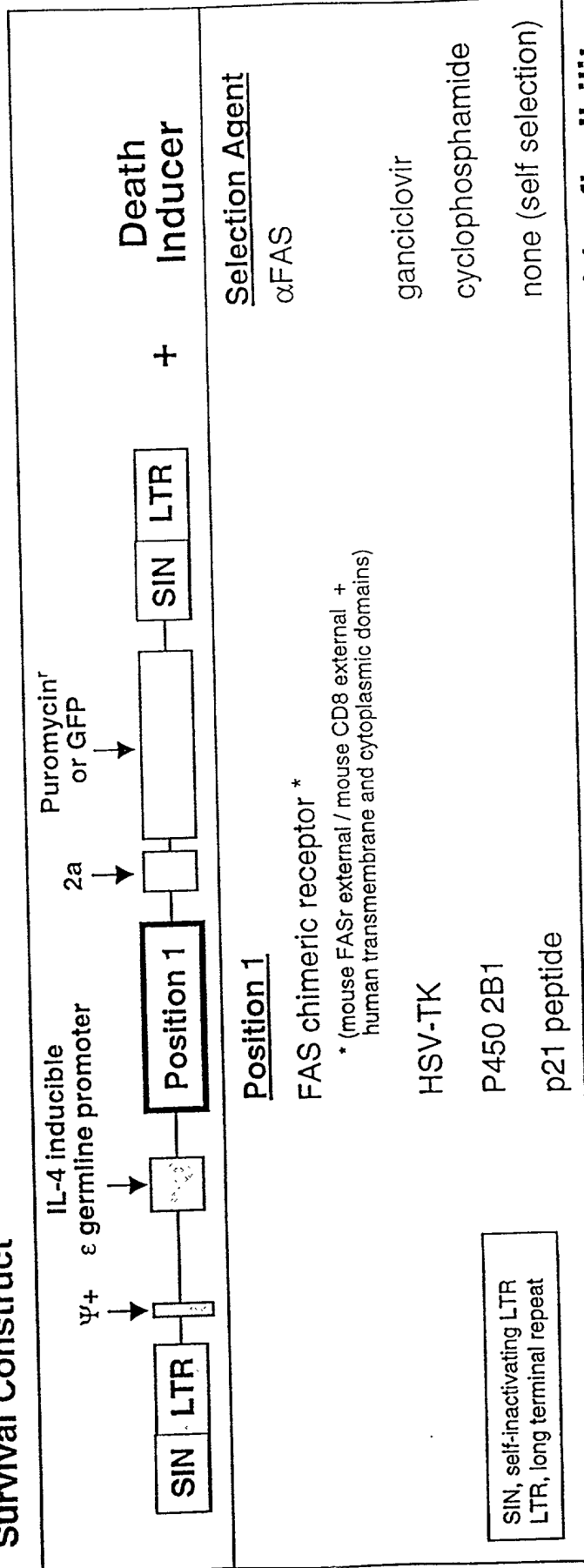


Appendix C

Screen for Peptide Inhibitors of the Germline ϵ Promoter



Survival Construct



All components are cassetted for flexibility

Appendix D

FIGURE 11A-1

1-845 CMV promoter/R/U5 5' LTR
 1322 GAG ATG-ATC mutation
 850-2100 extended Ψ region
 2146-2173 two Bstx1 peptide cloning sites
 2205-2723 ECMV IRES (cloned as EcoR1/MscI fragment from
 pCITE-4a [Novagen])
 2746-3465 GFP coding region
 3522-4115 3' LTR
 4122-6210 pGEM backbone (pUC origin, ampR)

ATCACGAGGCCCTTTCGTCTTCAAGAACAGCTTTGCTCTTAGGAGTTTCCTAATACATCC
 CAAACTCAAATATATAAAGCATTGTGACTTGTCTATGCCCTAGTTATTAATAGTAATCAA
 TTACGGGGTCATTAGTTTCATAGCCCATATATGGAGTTCGCGTTACATAACTTACGGTAA
 ATGGCCCCGCTGGCTGACCGCCCAACGACCCCCGCCATTGACGTCAATAATGACGTATG
 TTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTTACGGT
 AAACTGCCCCACTTGGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGACG
 TCAATGACGGTAAATGGCCCGCCTGGCATTATGCCCAGTACATGACCTTATGGGACTTTC
 CTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTACCATGGTGATGCGGTTTTGGC
 AGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGGATTTCGAAGTCTCCACCCCA
 TTGACGTCAATGGGAGTTTGTTTTGGCACCAAAATCAACGGGACTTTCCAAAATGTCGTA
 ACAACTCCGCCCCATTGACGCAAAATGGGCGGTAGGCATGTACGGTGGGAGGTCTATATAA
 GCAGAGCTCAATAAAAGAGCCCAACCCCTCACTCGGGGCGCCAGTCTCCGATTGACT
 GAGTCGCCCCGGGTACCCGTGTATCCAATAAACCCCTCTTGCAAGTTGCATCCGACTTGTGGT
 CTCGCTGTTCCCTGGGAGGGTCTCCTCTGAGTGATTGACTACCCGTCAGCGGGGGTCTTT
 CATTTGGGGGCTCGTCCGGGATCGGGAGACCCCTGCCAGGGACCACCGACCCACCACCG
 GGAGGTAAGCTGGCCAGCAACTTATCTGTGTCTGTCCGATTGTCTAGTGTCTATGACTGA
 TTTTATGCGCCTGCGTCCGTACTAGTTAGCTAACTAGCTCTGTATCTGGCGGACCCGTGG
 TGGAAGTACGAGTTTCGGAACACCCGGCCGCAACCCTGGGAGACGTCCCAGGGACTTCGG
 GGGCCGTTTTTGTGGCCCGACCTGAGTCCAAAAATCCCGATCGTTTTTGGACTCTTTGGTG
 CACCCCCCTTAGAGGAGGGATATGTGGTTCTGGTAGGAGACGAGAACCTAAACAGTTCC
 CGCCTCCGTCTGAATTTTTGCTTTTCGGTTTGGGACCGAAGCCGCGCCGCGCTTGTCT
 GCTGCAGCATCGTTCTGTGTTGTCTCTGTCTGACTGTGTTTCTGTATTTGTCTGAAAATA
 TCGGCCCCGGGCCAGACTGTTACCACTCCCTTAAGTTTGACCTTAGGTCACCTGGAAAGATG
 TCGAGCGGATCGCTCACAACCAGTCGGTAGATGTCAAGAAGAGACGTTGGGTACCTTCT
 GCTCTGCAGAATGGCCAACCTTTAACGTCGGATGGCCGCGAGACGGCACCTTTAACCGAG
 ACCTCATCACCCAGGTAAAGATCAAGGCTTTTACCTGGCCCGCATGGACACCCAGACC
 AGGTCCCCCTACATCGTGACCTGGGAAGCCTTGGCTTTTGACCCCCCTCCCTGGGTCAAGC
 CCTTTGTACACCCTAAGCCTCCGCCTCCTCTTCCCTCCATCCGCCCCGTCTCTCCCCCTTG
 AACCTCCTCGTTTCGACCCCCGCTCGATCCTCCCTTTATCCAGCCCTCACTCCTTCTCTAG
 GCGCCCCCATATGGCCATATGAGATCTTATATGGGGCACCCCCGCCCCCTTGTAACCTTCC
 CTGACCCCTGACATGACAAGAGTTACTAACAGCCCCTCTCTCCAAGCTCACTTACAGGCTC
 TCTACTTAGTCCAGCACGAAGTCTGGAGACCTCTGGCGGCAGCCTACCAAGAACAAGTGG
 ACCGACCGGTGGTACCTCACCTTACCGAGTCGGCGACACAGTGTGGGTCCGCCGACACC
 AGACTAAGAACCTAGAACCTCGCTGGAAAGGACCTTACACAGTCCTGCTGACCACCCCCA
 CCGCCCTCAAAGTAGACGGCATCGCGCTTGGATACACGCCGCCACGTGAAGGCTGCCGA
 CCCCCGGGGTGGACCATCCTCTAGACTGCCGGATCTCGAGGGATCCACCACCATGGACCC
 CCATTAAATTGGAATTCCTGCAGCCCCGGGGGATCCACTAGTTCTAGAGCGAATTAATTC

FIGURE 11A-2

GGTTATTTTCCACCATATTGCCGTCTTTTGGCAATGTGAGGGCCCGGAAACCTGGCCCTG
TCTTCTTGACGAGCATTCTAGGGGTCTTTCCCTCTCGCCAAAGGAATGCAAGGTCTGT
TGAATGTCGTGAAGGAAGCAGTTCCTCTGGAAGCTTCTTGAAGACAAACAACCTCTGTAG
CGACCTTTTGCAGGCAGCGGAACCCCCACCTGGCGACAGGTGCCTCTGCGGCCAAAAGC
CACGTGTATAAGATACACCTGCAAAGGCGGCACAACCCAGTGCCACGTTGTGAGTTGGA
TAGTTGTGGAAAGAGTCAAATGGCTCTCCTCAAGCGTATTCAACAAGGGGCTGAAGGATG
CCCAGAAGGTACCCCATTTGTATGGGATCTGATCTGGGGCCTCGGTGCACATGCTTTACAT
GTGTTTAGTCGAGGTTAAAAACGTCTAGGCCCCCCGAACCACGGGGACGTGGTTTTCTCT
TTGAAAAACACGATGATAATATGGGGGATCCACCGGTGCGCACCATGGTGAGCAAGGGCG
AGGAGCTGTTTACCGGGGTGGTGCCCATCCTGGTCGAGCTGGACGGCGACGTAAACGGCC
ACAAGTTCAGCGTGTCCGGCGAGGGCGAGGGCGATGCCACCTACGGCAAGCTGACCCTGA
AGTTTCATCTGCACACCGGCAAGCTGCCCGTGCCCTGGCCACCCCTCGTGACCACCTGA
CCTACGGCGTGACGTGCTTCAGCCGCTACCCGACCACATGAAGCAGCAGCACTTCTTCA
AGTCCGCCATGCCCGAAGGCTACGTCCAGGAGCGCACCATCTTCTTCAAGGACGACGGCA
ACTACAAGACCCGCGCCGAGGTGAAGTTCGAGGGCGACACCCTGGTGAACCGCATCGAGC
TGAAGGGCATCGACTTCAAGGAGGACGGCAACATCCTGGGGCACAAGCTGGAGTACAAC
ACAACAGCCACAACGTCTATATCATGGCCGACAAGCAGAAGAACGGCATCAAGGTGAAC
TCAAGATCCGCCACAACATCGAGGACGGCAGCGTGACGCTCGCCGACCACTACCAGCAGA
ACACCCCATCGCGACGGCCCCGTGCTGCTGCCCCGACAACCACTACCTGAGCACCCAGT
CCGCCCTGAGCAAAGACCCCAACGAGAAGCGCGATCACATGGTCTCTGGAGTTCGTGA
CCGCCCGCGGGATCACTCTCGGCATGGACGAGCTGTACAAGTAAAGCGGCCGCTCGACGA
TAAAATAAAAGATTTTATTTAGTCTCCAGAAAAAGGGGGGAATGAAAGACCCACCTGTA
GGTTTGGCAAGCTAGCTTAAGTAACGCCATTTTGGCAAGGCATGGAAAAATACATAACTGA
GAATAGAGAAGTTCAGATCAAGGTCAGGAACAGATGGAACAGCTGAATATGGGCCAAACA
GGATATCTGTGGTAAGCAGTTCTTGCCCCGGCTCAGGGCCAAGAACAGATGGAACAGCTG
AATATGGGCCAAACAGGATATCTGTGGTAAGCAGTTCCTGCCCCGGCTCAGGGCCAAGAA
CAGATGGTCCCCAGATGCGGTCCAGCCCTCAGCAGTTTCTAGAGAACCATCAGATGTTTC
CAGGGTGCCCCAAGGACCTGAAATGACCCTGTGCCTTATTTGAACTAACCAATCAGTTTCG
CTTCTCGCTTCTGTTTCGCGCGCTTCTGCTCCCCGAGCTCAATAAAAGAGCCCACAACCC
TCACTCGGGGCGCCAGTCTCCGATTGACTGAGTCGCCCCGGGTACCCGTGTATCCAATAA
ACCCTCTTGCAAGTTGCATCCGACTTGTGGTCTCGCTGTTTCTTGGGAGGGTCTCCTCTGA
GTGATTGACTACCCGTCAGCGGGGGTCTTTTCAATTTCCGACTTGTGGTCTCGCTGCCTTGG
GAGGGTCTCCTCTGAGTGATTGACTACCCGTCAGCGGGGGTCTTACATGCAGCATGTAT
CAAAATTAATTTGGTTTTTTTTTCTTAAGTATTTACATTAAATGGCCATAGTTGCATTAAT
GAATCGGCCAACGCGCGGGGAGAGGGCGGTTTGGCTATTGGCGCTCTTCCGCTTCTCGCT
CACTGACTCGCTGCGCTCGGTGCTTGGCTGCGGCGAGCGGTATCAGCTCACTCAAAGGC
GGTAATACGGTTATCCACAGAATCAGGGGATAACGCGAGGAAAGAACATGTGAGCAAAAGG
CCAGCAAAAGGCCAGGAACCGTAAAAAGGCCGCGTGTGCTGGCGTTTTTCCATAGGCTCCG
CCCCCTGACGAGCATCACAAAAATCGACGCTCAAGTCAGAGGTGGCGAAACCCGACAGG
ACTATAAAGATAACAGGCGTTTCCCCCTGGAAGCTCCCTCGTGCGCTCTCCTGTTCCGAC
CCTGCCGCTTACCGGATACCTGTCCGCTTTCTCCCTTCGGGAAGCGTGGCGCTTTCTCA
TAGCTCACGCTGTAGGTATCTCAGTTCGGTGTAGGTGCTTCGCTCCAAGCTGGGCTGTGT
GCACGAACCCCCCGTTACGCCCCGACCGCTGCGCCTTATCCGGTAACATATCGTCTTGAGTC
CAACCCGTAAGACACGACTTATCGCCACTGGCAGCAGCCACTGGTAACAGGATTAGCAG
AGCGAGGTATGTAGGCGGTGCTACAGAGTCTTGAAGTGGTGGCCTAACTACGGCTACAC
TAGAAGGACAGTATTTGGTATCTGCGCTCTGCTGAAGCCAGTTACCTTCGGAAAAAGAGT
TGGTAGCTCTTGATCCGGCAAACAAACCACCGCTGGTAGCGGTGGTTTTTTTTTGTGTTGCAA
GCAGCAGATTACGCGCAGAAAAAAGGATCTCAAGAAGATCCTTTGATCTTTTCTACGGG
GTCTGACGCTCAGTGGAACGAAAACTCACGTTAAGGGATTTTGGTTCATGAGATTATCAAA
AAGGATCTTCACTAGATCCTTTTAAATTAATAATGAAGTTTGGCGAAATCAATCTAAAG
TATATATGAGTAACTTGGTCTGACAGTTACCAATGCTTAATCAGTGAGGCACCTATCTC
AGCGATCTGTCTATTTCTGTTTCATCCATAGTTGCCTGACTCCCCGTCGTGTAGATAACTAC
GATACGGGAGGGCTTACCATCTGGCCCCAGTGCTGCAATGATACCGCGAGACCCACGCTC
ACCGGCTCCAGATTTATCAGCAATAAACCAGCCAGCCGGAAGGGCCGAGCGCAGAAGTGG

FIGURE 11A-3

TCCTGCAACTTTATCCGCCTCCATCCAGTCTATTAATTGTTGCCGGAAGCTAGAGTAAG
TAGTTCGCCAGTTAATAGTTTGCGCAACGTTGTTGCCATTGCTACAGGCATCGTGGTGTC
ACGCTCGTCGTTTGGTATGGCTTCATTCAGCTCCGGTTCCCAACGATCAAGGCGAGTTAC
ATGATCCCCCATGTTGTGCAAAAAAGCGGTTAGCTCCTTCGGTCCTCCGATCGTTGTCAG
AAGTAAGTTGGCCGCGAGTGTATCACTCATGGTTATGGCAGCACTGCATAATTCTCTTAC
TGTCATGCCATCCGTAAGATGCTTTTCTGTGACTGGTGAGTACTCAACCAAGTCATTCTG
AGAATAGTGTATGCGGCGACCGAGTTGCTCTTGCCCGGCGTCAACACGGGATAATACCGC
GCCACATAGCAGAACTTTAAAAGTGCTCATCATTTGGAAAACGTTCTTCGGGGCGAAAAC
CTCAAGGATCTTACCGCTGTTGAGATCCAGTTCGATGTAACCCACTCGTGCACCCAACTG
ATCTTCAGCATCTTTTACTTTTACCAGCGTTTCTGGGTGAGCAAAAACAGGAAGGCAAAA
TGCCGCAAAAAAGGGAATAAGGGCGACACGGAAATGTTGAATACTCATACTCTTCCTTTT
TCAATATTATTGAAGCATTTATCAGGGTTATTGTCTCATGAGCGGATACATATTGAATG
TATTTAGAAAAATAAACAAATAGGGGTTCCGCGCACATTC

TCCTGCAACTTTATCCGCCTCCATCCAGTCTATTAATTGTTGCCGGAAGCTAGAGTAAG

FIGURE 11B-1

1-845 CMVpormoter/R/U5 5' LTR
1322 GAG ATG-ATC mutation
850-2100 extended □ region
2151-2865 GFP coding region
2866-2894 GGGSGGG linker
2895-2952 FMDV 2a cleavage sequence
2953-3004 Bstx1/Bstx1/HinD3/Hpa1/Sal1/Not1 polylinker
3052-3645 3' LTR
3652-5715 pGEM backbone (pUC origin, ampR)

ATCACGAGG¹CCCTTTCGTCTTCAAGAACAGCTTTGCTCTTAGGAGTTTQCTAATACATC
CCAAACTCAAATATATAAAGCATTTGACTTGTTCTATGCCCTAGTTATTAATAGTAATC
AATTACGGGGTTCATTAGTTTCATAGCCCATATATGGAGTTCCGCGTTACATAACTTACGG
TAAATGGCCCCGCCTGGCTGACCGCCCAACGACCCCCGCCCATTGACGTCAATAATGACG
TATGTTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTT
ACGGTAAACTGCCCCACTTGGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTA
TTGACGTCAATGACGGTAAATGGCCCCGCCTGGCATTATGCCCAGTACATGACCTTATGG
GACTTTCCTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTACCATGGTGATGCG
GTTTTGGCAGTACATCAATGGGCGTGATAGCGGTTTGA²CTCACGGGGATTTC³CAAGTC
TCCACCCCATTGACGTCAATGGGAGTTTGT⁴TTTGGCACCAAAATCAACGGGACTTTCCA
AAATGTCGTAACA⁵ACTCCGCCCCATTGACGCAAATGGGCGGTAGGCATGTACGGTG⁶GGA
GGTCTATATAAGCAGAGCTCAATAAAAGAGCCCACAACCCCTCACTCGGGGCGCCAGTC
CTCCGATTGACTGAGTCGCCCCGGGTACCCGTGTATCCAATAAACCCCTCTTG⁷CAGTTGCA
TCCGACTTGTGGTCTCGCTGTTCTTGGGAGGGTCTCCTCTGAGTGATTGACTACCCGT
CAGCGGGGGTCTTT⁸CATTTGGGGGCTCGTCCGGGATCGGGAGACCCCTGCCCAGGGACC
ACCGACCCACCACCGGAGGTAAGCTGGCCAGCAACTTATCTGTGTCTGTCCGATTGTC
TAGTGTCTATGACTGATTTTATGCGCCTGCGTCGGTACTAGTTAGCTAACTAGCTCTGT
ATCTGGCGGACCCGTGGTGGAACTGACGAGTTCGGAACACCCGGCCGCAACCCTGGGAG

FIGURE 11B-2

ACGTCCCAGGGACTTCGGGGGCGGTTTTGTGGCCCGACCTGAGTCCAAAAATCCCGAT
CGTTTTGGACTCTTTGGTGCACCCCCCTTAGAGGAGGGATATGTGGTTCTGGTAGGAGA
CGAGAACCTAAAACAGTTCCCGCCTCCGTCTGAATTTTTGCTTTTCGGTTTGGGACCGAA
GCCGCGCCGCGCGTCTTGTCTGCTGCAGCATCGTTCTGTGTTGTCTCTGTCTGACTGTG
TTTCTGTATTTGTCTGAAAATATCGGCCCCGGGCCAGACTGTTACCACTCCCTTAAGTTT
GACCTTAGGTCACTGGAAAGATGTGAGCGGATCGCTCACAACCAGTCGGTAGATGTCA
AGAAGAGACGTTGGGTTACCTTCTGCTCTGCAGAATGGCCAACCTTTAACGTCGGATGG
CCGCGAGACGGCACCTTTAACCGAGACCTCATCACCCAGGTTAAGATCAAGGTCTTTTC
ACCTGGCCCCGCATGGACACCCAGACCAGGTCCCCTACATCGTGACCTGGGAAGCCTTGG
CTTTTGACCCCCCTCCCTGGGTCAAGCCCTTTGTACACCCTAAGCCTCCGCCTCCTCTT
CCTCCATCCGCCCCGTCTCTCCCCCTTGAACCTCCTCGTTTCGACCCCGCCTCGATCCTC
CCTTTATCCAGCCCTCACTCCTTCTCTAGGCGCCCCCATATGGCCATATGAGATCTTAT
ATGGGGCACCCCCCGCCCCCTTGTAACCTTCCCTGACCCTGACATGACAAGAGTTACTAAC
AGCCCCCTCTCTCCAAGCTCACTTACAGGCTCTCTACTTAGTCCAGCACGAAGTCTGGAG
ACCTCTGGCGGCAGCCTACCAAGAACAACCTGGACCGACCGGTGGTACCTCACCTTACC
GAGTCGGCGACACAGTGTGGGTCCGCGGACACCAGACTAAGAACCTAGAACCTCGCTGG
AAAGGACCTTACACAGTCTTGCTGACCACCCCCACCGCCCTCAAAGTAGACGGCATCGC
AGCTTGGATACACGCCGCCACGTGAAGGCTGCCGACCCCGGGGTGGACCATCCTCTA
GACTGCCGGATCTCGAGGGATCCACCATGGTGAGCAAGGGCGAGGAGCTGTTACCGGG
GTGGTGCCCATCCTGGTCGAGCTGGACGGCGACGTAAACGGCCACAAGTTCAGCGTGTC
CGGCGAGGGCGAGGGCGATGCCACCTACGGCAAGCTGACCCTGAAGTTCATCTGCACCA
CCGGCAAGCTGCCCCGTGCCCTGGCCCCACCTCGTGACCACCTGACCTACGGCGTGACG
TGCTTCAGCCGCTACCCCGACCACATGAAGCAGCACGACTTCTTCAAGTCCGCCATGCC
CGAAGGCTACGTCCAGGAGCGCACCATCTTCTTCAAGGACGACGGCAACTACAAGACCC
GCGCCGAGGTGAAGTTCGAGGGCGACACCCTGGTGAACCGCATCGAGCTGAAGGGCATC
GACTTCAAGGAGGACGGCAACATCCTGGGGCACAAGCTGGAGTACAACCTACAACAGCCA
CAACGTCTATATCATGGCCGACAAGCAGAAGAACGGCATCAAGGTGAACCTCAAGATCC
GCCACAACATCGAGGACGGCAGCGTGCAGCTCGCCGACCACTACCAGCAGAACACCCCC
ATCGGCGACGGCCCCGTGCTGCTGCCCCGACAACCACTACCTGAGCACCCAGTCCGCCCT
GAGCAAAGACCCCAACGAGAAGCGCGATCACATGGTCTTGCTGGAGTTCGTGACCGCCG
CCGGGATCACTCTCGGCATGGACGAGCTGTACAAGGAATTCGGAGGTGGCAGCGGTGGC
GGTCAGCTGTTGAATTTTGACCTTCTTAAACTTGCGGGAGACGTGAGTCCAACCCTGG
GCCACCACCACCATGGAAGCTTCCATTAAATTGGTTAACGTCGACGCGGCCGCTCGAC
GATAAAATAAAAGATTTTATTTAGTCTCCAGAAAAAGGGGGGAATGAAAGACCCACCT
GTAGGTTTGGCAAGCTAGCTTAAGTAACGCCATTTTGCAAGGCATGGAAAAATACATAA
CTGAGAAATAGAGAAGTTCAGATCAAGGTCAGGAACAGATGGAACAGCTGAATATGGGCC
AAACAGGATATCTGTGGTAAGCAGTTTCTGCCCCGGCTCAGGGCCAAGAACAGATGGAA
CAGCTGAATATGGGCCAAACAGGATATCTGTGGTAAGCAGTTTCTGCCCCGGCTCAGGG
CCAAGAACAGATGGTCCCCAGATGCGGTCCAGCCCTCAGCAGTTTCTAGAGAACCATCA
GATGTTTCCAGGGTGCCCCAAGGACCTGAAATGACCTGTGCCTTATTTGAACTAACCA
ATCAGTTCGCTTCTCGCTTCTGTTTCGCGCGCTTCTGCTCCCCGAGCTCAATAAAAGAGC
CCACAACCCCTCACTCGGGGCGCCAGTCTCCGATTGACTGAGTCGCCCCGGGTACCCGT
GTATCCAATAAACCTCTTGCAGTTGCATCCGACTTGTGGTCTCGCTGTTCTTGGGAG
GGTCTCCTCTGAGTGATTGACTACCCGTCAGCGGGGGTCTTTCATTTCCGACTTGTGGT
CTCGCTGCCTTGGGAGGGTCTCCTCTGAGTGATTGACTACCCGTCAGCGGGGGTCTTCA
CATGCAGCATGTATCAAAATTAATTTGGTTTTTTTTCTTAAGTATTTACATTAAATGGC
CATAGTTGCATTAATGAATCGGCCAACGCGCGGGGAGAGGCGGTTTGGCGTATTTGGCGCT

FIGURE 11B-3

CTTCCGCTTCCTCGCTCACTGACTCGCTGCGCTCGGTTCGCTTCGGCTGCGGCGAGCGGTA
TCAGCTCACTCAAAGGCGGTAATACGGTTATCCACAGAATCAGGGGATAACGCAGGAAA
GAACATGTGAGCAAAAGGCCAGCAAAAGGCCAGGAACCGTAAAAAGGCCGCGTTGCTGG
CGTTTTTCCATAGGCTCCGCCCCCTGACGAGCATCACAAAAATCGACGCTCAAGTCAG
AGGTGGCGAAACCCGACAGGACTATAAAGATAACCAGGCGTTTCCCCCTGGAAGCTCCCT
CGTGCGCTCTCCTGTTCCGACCCTGCCGCTTACCGGATACCTGTCCGCTTTCTCCCTT
CGGGAAGCGTGGCGCTTTCTCATAGCTCACGCTGTAGGTATCTCAGTTCGGTGTAGGTC
GTTTCGCTCCAAGCTGGGCTGTGTGCACGAACCCCCCGTTCAGCCCGACCGCTGCGCCTT
ATCCGGTAACTATCGTCTTGAGTCCAACCCGGTAAGACACGACTTATCGCCACTGGCAG
CAGCCACTGGTAACAGGATTAGCAGAGCGAGGTATGTAGGCGGTGCTACAGAGTTCTTG
AAGTGGTGGCCTAACTACGGCTACACTAGAAGGACAGTATTTGGTATCTGCGCTCTGCT
GAAGCCAGTTACCTTCGGAAAAAGAGTTGGTAGCTCTTGATCCGGCAAACAAACCACCG
CTGGTAGCGGTGGTTTTTTTTGTTTGCAAGCAGCAGATTACGCGCAGAAAAAAGGATCT
CAAGAAGATCCTTTGATCTTTTCTACGGGGTCTGACGCTCAGTGGAACGAAAACACAG
TTAAGGGATTTTGGTCATGAGATTATCAAAAAGGATCTTCACCTAGATCCTTTTAAATT
AAAAATGAAGTTTTCGCAAATCAATCTAAAGTATATATGAGTAACTTGGTCTGACAGT
TACCAATGCTTAATCAGTGAGGCACCTATCTCAGCGATCTGTCTATTTTCGTTTCATCCAT
AGTTGCCTGACTCCCCGTCGTGTAGATAACTACGATACGGGAGGGCTTACCATCTGGCC
CCAGTGCTGCAATGATACCGCGAGACCCACGCTCACC GGCTCCAGATTTATCAGCAATA
AACCAGCCAGCCGGAAGGGCCGAGCGCAGAAGTGGTCCTGCAACTTTATCCGCCTCCAT
CCAGTCTATTAATTGTTGCCGGAAGCTAGAGTAAGTAGTTCGCCAGTTAATAGTTTGC
GCAACGTTGTTGCCATTGCTACAGGCATCGTGGTGTACGCTCGTCGTTTGGTATGGCT
TCATTTCAGCTCCGGTTCCCAACGATCAAGGCGAGTTACATGATCCCCCATGTTGTGCAA
AAAAGCGGTTAGCTCCTTCGGTCCTCCGATCGTTGTCAGAAGTAAGTTGGCCGCAGTGT
TATCACTCATGGTTATGGCAGCACTGCATAATTCTCTTACTGTTCATGCCATCCGTAAGA
TGCTTTTCTGTGACTGGTGAGTACTCAACCAAGTCATTCTGAGAATAGTGTATGCGGCG
ACCGAGTTGCTCTTGCCCGGCGTCAACACGGGATAATACCGCGCCACATAGCAGAATT
TAAAAGTGCTCATCATTTGGAACCGTTCTTCGGGGCGAAAACCTCTCAAGGATCTTACCG
CTGTTGAGATCCAGTTCGATGTAACCCACTCGTGCACCCAACTGATCTTCAGCATCTTT
TACTTTTACCAGCGTTTCTGGGTGAGCAAAAACAGGAAGGCAAAATGCCGCAAAAAGG
GAATAAGGGCGACACGGAAATGTTGAATACTCATACTCTTCCTTTTCAATATTATTGA
AGCATTTATCAGGGTTATTGTCTCATGACATTAACCTATAAAAATAGGCGT

FIGURE 11C-1

1-845 CMVpormoter/R/U5 5' LTR
 1322 GAG ATG-ATC mutation
 850-2100 extended \square region
 2146-2173 two Bstx1 peptide cloning sites
 2173-2214 EoR1/Hpa1/Hpa1/Not1 polylinker
 2262-2855 3' LTR
 2855-4901 pGEM backbone (pUC origin, ampR)

ATCACGAGGCCCTTTTCGTCTTCAAGAACAGCTTTTGCTCTTAGGAGTTTCCTAATACATCCCAAACCTCAAAT--
 ATATAAAGCATTTGACTTGTTCTATGCCCTAGTTATTAATAGTAATCAATTACGGGGTCATTAGTTCATAG
 CCATATATGGAGTTCGCGTTACATAACTTACGGTAAATGGCCCGCCTGGCTGACCGCCCAACGACCCCCG
 CCCATTGACGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGG
 TGGAGTATTTACGGTAAACTGCCCCACTTGGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATT
 GACGTCAATGACGGTAAATGGCCCGCCTGGCATTATGCCCAGTACATGACCTTATGGGACTTTTCCTACTTG
 GCAGTACATCTACGTATTAGTCATCGCTATTACCATGGTGATGCGGTTTTGGCAGTACATCAATGGGCGTG
 GATAGCGGTTTTGACTCACGGGGATTTCCTAAGTCTCCACCCCATTTGACGTCAATGGGAGTTTTGTTTTGGCAC
 CAAAATCAACGGGACTTTCCAAAATGTCGTAACAACTCCGCCCCATTGACGCAAATGGGCGGTAGGCATGT
 ACGGTGGGAGGTCTATATAAGCAGAGCTCAATAAAAGAGCCCCACAACCCCTCACTCGGGCGCCAGTCCTC
 CGATTGACTGAGTCGCCCCGGGTACCCGTGTATCCAATAAACCCCTCTTGCAGTTGCATCCGACTTGTGGTCT
 CGCTGTTCTTTGGGAGGGTCTCCTCTGAGTGATTGACTACCCGTACGCGGGGGTCTTTTCAATTTGGGGGCTC
 TCCGGGATCGGGAGACCCCTGCCAGGGACCACCGACCCACCGGGAGGTAAGCTGGCCAGCAACTTA
 TCTGTGTCTGTCCGATTGTCTAGTGTCTATGACTGATTTTTATGCGCCTGCGTCCGTACTAGTTAGCTAACT
 AGCTCTGTATCTGGCGGACCCGTGGTGGAACTGACGAGTTCGGAACACCCGGCGCAACCCCTGGGAGACGT
 CCCAGGGACTTCGGGGGCGGTTTTTGTGGCCCGACCTGAGTCCAAAATCCCGATCGTTTTGGACTCTTTG
 GTGCACCCCTTAGAGGAGGGATATGTGGTCTGGTAGGAGACGAGAACCTAAAACAGTTCCCGCCTCCG
 TCTGAATTTTTGCTTTTCGGTTTTGGGACCGAAGCCGCGCGCGCTTGTCTGCTGCAGCATCGTTCTGTG
 TTGTCTCTGTCTGACTGTGTTTTCTGTATTTGTCTGAAAATATCGGCCCGGGCCAGACTGTTACCACTCCCT
 TAAGTTTGACCTTAGGTCACCTGGAAGATGTCGAGCGGATCGCTCACAACCAGTCGGTAGATGTCAAGAAG
 AGACGTTGGGTACCTTCTGCTCTGCAGAATGGCCAACCTTTAACGTCGGATGGCCCGGAGACGGCACCTT
 TAACCGAGACCTCATCACCCAGGTTAAGATCAAGGTCTTTTACCTGGCCCGCATGGACACCCAGACCAGG
 TCCCCTACATCGTGACCTGGGAAGCCTTGGCTTTTGACCCCCCTCCCTGGGTCAAGCCCTTTGTACACCT
 AAGCCTCCGCCTCCTCTTCTCCATCCGCCCCGTCTCTCCCCCTTGAACCTCCTCGTTGACCCCGCCTCG
 ATCCTCCCTTTATCCAGCCCTCACTCCTTCTCTAGGCGCCCCCATATGGCCATATGAGATCTTATATGGGG
 CACCCCGCCCCCTTGTAACCTTCCCTGACCTGACATGACAAGAGTTACTAACAGCCCCCTCTCTCCAAGCT
 CACTTACAGGCTCTCTACTTAGTCCAGCACGAAGTCTGGAGACCTCTGGCGGCAGCCTACCAAGAACAAC
 GGACCGACCGGTGGTACCTCACCTTACCGAGTCGGCGACACAGTGTGGGTCCGCGGACACCAGACTAAGA
 ACCTAGAACCTCGCTGGAAGGACCTTACACAGTCTGCTGACCACCCCGCCCTCAAAGTAGACGGC
 ATCGCAGCTTGATACACGCGCCACGTGAAGGCTGCCGACCCCGGGGTGGACCATCCTCTAGACTGCC
 GGATCTCGAGGGATCCACCACCATGGACCCCATTAATTTGGAATTCGGGGCCCAAGCTTTGTAAACGTG
 ACGCGGCGCGCTCGACGATAAAATAAAAGATTTTATTTAGTCTCCAGAAAAAGGGGGAATGAAAGACCC
 CACCTGTAGGTTTGGCAAGCTAGCTTAAGTAACGCCATTTTGCAAGGCATGGAAAAATACATAACTGAGAA
 TAGAGAAGTTCAGATCAAGGTGAGGAACAGATGGAACAGCTGAATATGGGCCAAACAGGATATCTGTGGTA
 AGCAGTTCTGCCCCGGCTCAGGGCCAAGAACAGATGGAACAGCTGAATATGGGCCAAACAGGATATCTGT
 GGTAAGCAGTTCTGCCCCGGCTCAGGGCCAAGAACAGATGGTCCCCAGATGCGGTCCAGCCCTCAGCAGT
 TTCTAGAGAACCATCAGATGTTTCCAGGGTGCCCCAAGGACCTGAAATGACCCTGTGCCTTATTTGAACTA
 ACCAATCAGTTTCGCTTCTCGCTTCTGTTTCGCGCGCTTCTGCTCCCCGAGCTCAATAAAAGAGCCCAACC
 CCTCACTCGGGGCGCCAGTCCTCCGATTGACTGAGTCGCCCCGGGTACCCGTGTATCCAATAAACCCCTCTTG

11C-1

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150	2151	2152	2153	2154	2155	2156	2157	2158	2159	2160	2161	2162	2163	2164	2165	2166	2167	2168	2169	2170	2171	2172	2173	2174	2175	2176	2177	2178	2179	2180	2181	2182	2183	2184	2185	2186	2187	2188	2189	2190	2191	2192	2193	2194	2195	2196	2197	2198	2199	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	2221	2222	2223	2224	2225	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2236	2237	2238	2239	2240	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2253	2254	2255	2256	2257	2258	2259	2260	2261	2262	2263	2264	2265	2266	2267	2268	2269	2270	2271	2272	2273	2274	2275	2276	2277	2278	2279	2280	2281	2282	2283	2284	2285	2286	2287	2288	2289	2290	2291	2292	2293	2294	2295	2296	2297	2298	2299	2300	2301	2302	2303	2304	2305	2306	2307	2308	2309	2310	2311	2312	2313	2314	2315	2316	2317	2318	2319	2320	2321	2322	2323	2324	2325	2326	2327	2328	2329	2330	2331	2332	2333	2334	2335	2336	2337	2338	2339	2340	2341	2342	2343	2344	2345	2346	2347	2348	2349	2350	2351	2352	2353	2354	2355	2356	2357	2358	2359	2360	2361	2362	2363	2364	2365	2366	2367	2368	2369	2370	2371	2372	2373	2374	2375	2376	2377	2378	2379	2380	2381	2382	2383	2384	2385	2386	2387	2388	2389	2390	2391	2392	2393	2394	2395	2396	2397	2398	2399	2400	2401	2402	2403	2404	2405	2406	2407	2408	2409	2410	2411	2412	2413	2414	2415	2416	2417	2418	2419	2420	2421	2422	2423	2424	2425	2426	2427	2428	2429	2430	2431	2432	2433	2434	2435	2436	2437	2438	2439	2440	2441	2442	2
--	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	---

CAGTTGCATCCGACTTGTGGTCTCGCTGTTCCCTTGGGAGGGTCTCCTCTGAGTTGACTACCCGTCAGG
GGGGGTCTTTCAATTTCCGACTTGTGGTCTCGCTGCCTTGGGAGGGTCTCCTCTGAGTGATTGACTACCCGT
CAGCGGGGTCTTCACATGCAGCATGTATCAAAATTAATTTGGTTTTTTTTTCTTAAGTATTTACATTAAAT
GGCCATAGTTGCATTAATGAATCGGCCAACGCGCGGGGAGAGCGGTTTTGCGTATTGGCGCTCTTCCGCTT
CCTCGCTACTGTGACTCGCTGCGCTCGGTTCGGTGC GGCGAGCGGTATCAGCTCACTCAAAGGCGGTA
ATACGGTTATCCACAGAATTACAGGGGATAACGCAGGAAAGAACATGTGAGCAAAAGGCCAGCAAAAGGCCAG
GAACGGTAAAAAGGCGCGTTGCTGGCGTTTTTCCATAGGCTCCGCCCCCTGACGAGCATCACAAAAATC
GACGCTCAAGTCAGAGGTGGCGAAACCCGACAGGACTATAAAGATACCAGGCGTTTCCCCCTGGAAGCTCC
CTCGTGCGCTCTCCTGTTCCGACCCTGCCGCTTACCGGATACCTGTCCGCTTTCTCCCTTCGGGAAGCGT
GGCGCTTTCTCATAGCTCACGCTGTAGGTATCTCAGTTCGGTGTAGGTCGTTGCTCCAAGCTGGGCTGTG
TGCACGAACCCCCCGTTACGCCGACCGCTGCGCCTTATCCGGTAACATATCGTCTTGAGTCCAACCCGGTA
AGACACGACTTATCGCCACTGGCAGCAGCCACTGGTAACAGGATTAGCAGAGCGAGGTATGTAGGCGGTGC
TACAGAGTTCTTGAAGTGGTGGCCTAACTACGGCTACACTAGAAGGACAGTATTTGGTATCTGCGCTCTGC
TGAAGCCAGTTACCTTCGGAAAAAGAGTTGGTAGCTCTTGATCCGGCAAACAAACCACCGCTGGTAGCGGT
GGTTTTTTTTTGTGTTGCAAGCAGCAGATTACGCGCAGAAAAAAGGATCTCAAGAAGATCCTTTTGATCTTTTC
TACGGGGTCTGACGCTCAGTGGAACGAAACTCACGTTAAGGGATTTTGGTCATGAGATTATCAAAAAGGA
TCTTCACCTAGATCCTTTTAAATTA AAAATGAAGTTTGCGCAAATCAATCTAAAGTATATATGAGTAAACT
TGGTCTGACAGTTACCAATGCTTAATCAGTGAGGCACCTATCTCAGCGATCTGTCTATTTCTGTTTCATCCAT
AGTTGCCTGACTCCCCGTCGTGTAGATAACTACGATACGGGAGGGCTTACCATCTGGCCCCAGTGCTGCAA
TGATACCGCGAGACCCACGCTCACCGGCTCCAGATTTATCAGCAATAAACCAGCCAGCCGGAAGGGCCGAG
CGCAGAAGTGGTCCTGCAACTTTATCCGCCTCCATCCAGTCTATTAATTGTTGCCGGGAAGCTAGAGTAAG
TAGTTGCGCCAGTTAATAGTTTGCGCAACGTTGTTGCCATTGCTACAGGCATCGTGGTGTCACGCTCGTCTGT
TTGGTATGGCTTCATTCAGCTCCGGTTCCCAACGATCAAGGCGAGTTACATGATCCCCCATGTTGTGCAAA
AAAGCGGTTAGCTCCTTCGGTCTCCGATCGTTGTGTAAGTAAGTTGGCCGAGTGTATCTACTCATGGT
TATGGCAGCACTGCATAATTCTCTTACTGTCTGCCATCCGTAAGATGCTTTTTCTGTGACTGGTGAGTACT
CAACCAAGTCATTCGAGAATAGTGTATGCGGCGACCGAGTTGCTCTTCCCGCGCGTCAACACGGGATAAT
ACCGCGCCACATAGCAGAACTTTAAAAGTGCTCATCATTTGAAACAGTTCTTCGGGGCGAAAACCTCAAG
GATCTTACCGCTGTTGAGATCCAGTTTCGATGTAACCCACTCGTGCACCCAACTGATCTTCAGCATCTTTTA
CTTTCACCAAGCGTTTTCTGGGTGAGCAAAAACAGGAAGGCAAAATGCCGCAAAAAAGGGAATAAGGGCGACA
CGGAAATGTTGAATACTCATACTCTTCCTTTTTTCAATATTATTGAAGCATTTATCAGGGTTATTGTCTCAT
GACATTAACCTATAAAAATAGGCGT

FIG 12A

(1) C12ScFas Survival construct

C12ScFas: epsilon-cFas(CD95)-Ires-Hygro-BGH PolyA put into C12s vector backwards so that no leaky transcription happens through the cmv promoter.

atcacgaggccctttcgtcttcaagaacagctttgctcttaggagtttccctaatacatcccaaaactcaaatatataaagc
atttgacttgttctatgcccctagttattaatagtaataacacggtggtcattagttcatagcccatataggagttccg
cgttacataacttacggttaaatggcccgctggtgacgcccacgacccccgccattgacgtcaataatgacgtatg
ttcccatagtaacgccaatagggaactttccattgacgtcaaatgggtggagtatttacggttaaaactgcccaacttggcagta
catcaagtgtatcatatgccaagtacgccccctattgacgtcaaatgacggttaaatggcccgctggcattatgccagta
catgaccttatgggaactttcctacttggcagtaacatctacgtatttagtcacgtattacacatgggtgatgggttttggc
agtacatcaatggcggtggatagcggtttgactcacggggtatttccaagtctccacccccattgacgtcaatgggagtttg
ttttggcaccaaaatcaacgggactttccaaaatgtcgttaacaactccgccccattgacgcaaatggcggttaggcatgt
acggtgggaggtctctatataagaagagctcaataaagagcccacaacccctcactcggggagccagtcctccgattgact
gagtcgccccgggtacccgtgtatccaataaaccctcttgcagttgcatccgacttgtgtgtctcgctgttcccttgggaggg
tctcctctgagtgattgactaccgctcagcggggtctttcatttgggggctcgctccgggagccggagacccctgccag
ggaccacgacccacacgggaggttaagctggccagcaacttatctgtgtctgtcgtcgtattgtctagtgtctatgactga
ttttatgcgctcgctggttagttagtcaactagctctgtatctggcgacccggtggtggaactgacgagttcgga
caccggcgcccaaccctgggagacgtccagggacttcgggggcccgtttttgtggccgacgtgagtcacaaaatccccga
tcgttttggactctttggtgaccccccttagaggagggatagtgtgttctggttaggagacgagaacctaaacagttcc
cgctccgctctgaatttttgccttgcgtttgggacgaagccgcccgcgctctgtgtctgctgcagcatctgtgtgt
tgtctctgtctgactgtgtttctgtatttgcgtgaaaatattggcccgccagactgttaccactcccttaagtttgac
cttaggtcactggaagatgtcgagcggtacgtcacaaccagtcggttagatgtcaagaagagacgttgggttaccttct
gctctgcagaatggccaacctttaacgtcggtggcgcgagacggcactttaaccgagacctcatcaccaggttaag
atcaaggtcttttcaacctggcccgcatggacacccagaccaggtccccctacatcgtagcctgggaagccttggcttga
ccccctccctgggtcaagccttggacacccctagcctccctcttctccatccgccccgctctctcccccttg
aacctcctcgttgcaccccgctcgatcctccctttatccagccctcactcctctcttaggcgcccccatatggccat
gagatcttatatggggcaccgccgcccccttgaacttccctgacctgacatgacaagagttaactaacagccccctct
ccaagctcacttacaggtctctacttagtcacgacgaagcttgagacaccttgccggcagcctaccaagaacacagtg
accgacgggtggttacctcacccttacgacgtcgccgacacagtgctgggtccgcccagacactaagaacctagaacct
cgctggaaaggaccttacacagtcctgctgaccacccccaccgcccctcaaagtagacggcatcgagcttggatacacgc
cgccacgtgaaggctgccgacccccgggggtggaccatcctctagactgccGGATCTCGAGGGATCCTCCCCAGCATGCC

TGCTATTGTCTTCCCAATCCTCCCCCTTGCTGTCTGCCCCACCCACCCCCAGAATAGAATGACACCTACTCAGACAA

TGCGATGCAATTTCTCATTTTTATTAGGAAAGGACAGTGGGAGTGGCACCTTCCAGGGTCAAGGAAGGCACGGGGGAGGG

GCAAACAACAGATGGCTGGCAACTAGAAGGCACAGTTCGAGGTCTAGCTTGCCAAACCTACAGGTGGGGTCTTTCATTTCC

CCCTTTTCTGAGACTAAATAAAATCTTTTATTTTatcogatagatccccggtcggcatctactctatttccctttgcccctg
gacgagtgctggggcgctcggtttccactatcgccgagtagtacttctacacagccatcggtccagacggcgccgtcttgccg
gcgatttgtgtacgcccagacagttccgggtccggatcgacagtagtcgtgcacatcgaccctgcccgaagctgcatcatc
gaaattgcccgtcaaccaagctctgatagagttgggtcaagaccaatcgggagcatatacgccccggagccgcccgcgtcctg
caagctccggatgcctccgctcgaagtagcgctctgctgctccatacaagccaaccacggcctccagaagaagatgttg
gagacctgatttgggaatccccgaacatcgccctcgctccagtcgaatgacgctgttatgcccgcatttgcgtcaggac
attgttggagccgaaatccgctgacgaggtgcccgaacttcggggcagtcctcgccccaaagcatcagctcatcgagag
cctgcccagcgacgacgactgacggtgtcgtccatcacagtttgccagtgatacacatggggatcagcaatcgccgcatatg
aaatcacgccatgtatgtattgaccgattcccttgcgggtccgaatggggcgaacccgctcgcttggctaagatcgccgc
agcgatcgcatccatggcctccgacgacgggtgcagaacagcgggcagttcggtttcaggcaggtcttgcaacgtgacac
cctgtgcacggcgggagatgcaataggtcaggctctcgctaaattccccaatgtcaagcacttccggaatcgggagcgcg
gcccgtgcaaagtgcgataaaacataacgactttttagaaaccatcgccgagctatttaccgcgagacatataccacg
ccctcctacatcgaagctgaaagcacgagattcttgcctccgagagctgcatcaggtcggagacgctgtcgaactttt
cgatcagaaacttctcgacagacgtcgcggtgagttcaggctttttcatgggtattatcatcggttttttcaaaggaaaaac
cagtcccccgtggttcggggggcctagacgttttttaacctcgactaaacacatgtaagcatgtgacacgagggcccag
atcagatcccatataaatgggtaccttctgggcatccttcagcccccttgttgaatacgttggaggagaccatttgactc
tttccacaactatacaactcacaacgtggcactgggggttgtgcccgtttgcaggtgtatcttatacacgtggcttttgg
ccgagagggcacctgtcgccaggtggggggttccgctgctgcaagggtcgctacagacgttgggttcttctcaaggac
ttCCAGAGGAAGTCTTCTTACAGACATTCAACAGACCTTGCATTCTTTGGCGAGAGGGGAAAGACCCctagactaga

ccaagctttggatttcatttctgaagtttgaattttctgagtcactagtaatgtccttgaggatgatagctgaattttc
tctgcaagagtacaaagattggcttttttgagatcttttaataatgtgtcatacgttcttcttccatgaagttgatg
ccaattacgaagcagttgaactttctgttctgtgtcttggacattgtcattctttagctcatctattttggcttcat
tgacaccattctttcgaacaaagcctttaacttgacttagtgcatgactccagcaatagtggtgatattttactcaag
tcaacatcagataaatttattgcccactgtttcaggatttaaggttggagattcatgagaaccttgggtttcttctgtg
ctttctgcatgttttctgtacttcttcttccacaaacaattagtggaattggcaaaagaagaagcaaacgccc
ccaaccggtTTCTGGGACTTGTTCCTGCAGTTTGTATTGCTGGTGTGTCATGGCTCAAGGGTTCCATGTTTCACAC

GAGGCGCAGCGAACACAGTGTTCACAGCCAGGAGAATCGCAGTAGAAGTCTGGTTTGCATTGCATTGGTATTCTGGGT

CAGGGTGCAGTTTGTTCCTTCTAAACCATGCTCTTCATCGCAGAGTGTGCATCTTCTGCATTATCAGCATAATGGT

TCTTGTCCATGTACTCCTTCCCTTCTGTGCATGGGGCACAGGTGGTGTACCCCCATTCAATTTGCAGTCTCTCAACTTTT

FIG 12 B

TTTTTACCAGGTTGGCATGGTTGACAGCAAAATGGGCCCTCTTGATATAATCCTTCTGAGCAGTTTTTATCAGTTTCATG
AACCCGCTCTCTCAGCTTTAAACTCTCGGAGATGCTATTAGTACCTTGAGTATGAACTCTTAACTGTGAGCCAGCAAGCA
CCAGAGGCAGGACAGCCAGATCCACACCATgTGGGCTTTACCAACAGTACCGGAATGCCAAGCTTGCGGCCGCTTAAGA
GCTGTAATTGAACCTGGGAGTGGACACCTGTGGAGAGAAAAGGCAAAGTGGATGTCAGTAAGACCAATAGGTGCCTATCAG
AAACGCAAGAGTCTTCTCTGTCTCGACAAGCCAGTTTCTATTGGTCTCCTTAAACCTGTCTTGTAACCTTGATACTTAC
CTGCCCAGTGCCTCACGACCAACTTctgcaggaattcctggacagctcccagatgatcagtaaccgtggttgttatttct
gtgcccggcagtgaggcctgggtaggggagctctgcctcagtgctttcagctaaaaatggggtgggaaccccCaggagg
ccggggccgcccgtggaagtcccttttctctctctgttcttgggaagtcgattgagcaacagcgggggtcaggtgaggctcc
ttcactaccgatgcacaccgagtgctGggggaggttctcttctctcagggcccaacCccagggcccctgcctaggtccc
ggactctCactcttgacgcatgcgtggcttgggtggctccagtcagcaaaacttggggtcccgttgctgggaaaggagag
ggtactgggcatcgacgctctgcttccacgaaagccttgtgaagaaaggatgggggcgcttttgtgcaggagaatgagg
cgactgaggtgaactggccctcggggGcgcggtgtccagatgtgtgtgcagggcctcctgatggccgcagccctcgctcc
ctgtgaccgcttggagctggcacccctgagtggtggcctcacCTGTACTCACTCCCAGGTCAGTGTCTcgacGCGGCC
GCTCGAcgatAAAATAAAAGATTTTATTAGTCTCCAGAAAAAGGGGGAATGAAAGACCCACCTGTAGGTTTGGCAAg
ctagcTTAAGTAACCCATTTTGCAAGGCATGGAAAAATACATAACTGAGAATAGAGAAGTTCAGATCAAGGTCGGAACAG
ATGGAACAGGCAATAAAAGAGCCCACAACCCCTCACTCGGGGCGCCAGTCTCCGATTGACTGAGTCGCCCCGGGTACCCG
TGTATCCAATAAACCTCTTGCAGTTGCATCCGACTTGTGGTCTCGCTGTTCTTGGGAGGGTCTCCTCTGAGTGATTGA
CTACCCGTGAGCGGGGTCTTTCaactgcaGCATGTATCAAAATTAATTGGTTTTTTTTCTTAAGTATTTACATTAAAT
GGCCATagtttcGTAATCATGGTCATAGCTGTTTCTGTGTGAAATTGTATCCGCTCACAATTCACACAACATACGAG
CCGGAAGCATAAAAGTGTAAGCCTGGGGTGCCTAATGAGTGAGCTAACTCACATTAATTGCGTTGCGCTCACTGCCCCGT
TTCCAGTCGGGAAACCTGTCTGTCCAGCTGCATTAATGAATCGGCCAACGCGGGGAGAGGCGGTTTGGCTATTGGCGG
CTCTTCCGCTTCTCTCGCTCACTGACTCGCTGCGCTCGGTCTGCTCGGCTGCGGCGAGCGGTATCAGCTCACTCAAAGGCGG
TAATACGGTTATCCACAGAATCAGGGGATAACGCAGGAAGAACATGTGAGCAAAAGGCCAGCAAAAGGCCAGGAACCGT
AAAAAGGCCGCGTTGCTGGCGTTTTTCCATAGGCTCCGCCCCCTGACGAGCATCACAAAAATCGACGCTCAAGTCAGAG
GTGGCGAAACCCGACAGGACTATAAAGATACCAGGCGTTTTCCCCCTGGAAGCTCCCTCGTGCCTCTCTGTTCCGACCC
TGCCGCTTACCGGATACCTGTCCGCTTTTCTCCCTTCGGGAAGCGTGGCGCTTTCTCATAGCTCACGCTGTAGGTATCTC
AGTTCGGTGTAGGTGCTTCCGCTCCAAGCTGGGCTGTGTGCACGAACCCCCGTTTCAGCCGACCGCTGCGCCTTATCCGG
TAACTATCGTCTTGAGTCCAACCCGGTAAGACACGACTTATCGCCACTGGCAGCAGCCACTGGTAACAGGATTAGCAGAG
CGAGGTATGTAGGCGGTGCTACAGAGTCTTGAAGTGGTGGCTAACTACGGCTACACTAGAAGGACAGTATTTGGGTATC
TGCGCTCTGCTGAAGCCAGTTACCTTCGGA AAAAGAGTTGGTAGCTCTTGATCCGGCAAACAAACCACCGCTGGTAGCGG
TGGTTTTTTTTGTTTGCAAGCAGCAGATTACGCGCAGAAAAAAGGATCTCAAGAAGATCCTTTGATCTTTTCTACGGGGT
CTGACGCTCAGTGAACGAAAACTCACGTTAAGGATTTTGGTCATGAGATTATCAAAAAGGATCTTCACCTAGATCCTT
TTAAATTA AAAATGAAGTTTGGCGAAATCAATCTAAAGTATATATGAGTAAACTTGGTCTGACAGTTACCAATGCTTAAT
CAGTGAGGCACCTATCTCAGCGATCTGTCTATTTTCGTTTCATCCATAGTTGCCTGACTCCCCGTGCTGTAGATAACTACGA
TACGGGAGGGCTTACCATCTGGCCCCAGTGCTGCAATGATACGCGAGACCCACGCTCACCGGCTCCAGATTTATCAGCA
ATAAACCAGCCAGCCGGAAGGGCCGAGCGCAGAAGTGGTCTGCAACTTTATCCGCTCCATCCAGTCTATTAATTGTTG
CCGGAAGCTAGAGTAAGTAGTTTCGCCAGTTAATAGTTTGCGCAACGTTGTTGCCATTGCTACAGGCATCGTGGTGTAC
GCTCGTCTGTTTGGTATGGCTTCATTCAGCTCCGGTTCCTAACGATCAAGGCGAGTTACATGATCCCCCATGTTGTGCAAA
AAAGCGGTTAGCTCCTTCGGTCTCCGATCGTTGTGAGAAGTAAGTTGGCCGAGTGTATCACTCATGGTTATGGCAGC

626966

FIG 12C

ACTGCATAATTCTCTTACTGTCATGCCATCCGTAAGATGCTTTTCTGTGACTGGTGagtactcaaccaagtcattctgag

aatagtgtatgcgggcgaccgagttgctcttgcccggcggtcaacacgggataataccgcgccacatagcagaactttaaaa
gtgctcatcattggaaaacgttcttcggggcgaaaactctcaaggatcttaccgctgttgagatccagttcgatgtaacc
cactcgtgcacccaactgatcttcagcatcttttactttcaccagcgtttctgggtgagcaaaaacaggaaggcaaaatg
cgcaaaaaaggggaataagggcgacacggaaatgttgaatactcatactcttcctttttcaatattattgaagcatttat
cagggttattgtctcatgacattaacctataaaaaataggcgt

600 500 400 300 200 100 0

FIG 13A

(2) Ahhhh: Survival construct

2.) Ahhhh: epsilon-cFas' (CD8 or mLyt2)-Ires-Hygro-BGHpolyA also in C12s backwards

atcacgagggccttctcgtcttcaagaacagcttttgcctttaggagtttqctaatacatccpaaactcaaataataaagc
atttgacttgttctatgccctagttattaatagtaatacaattacgggggtcattagttcatagcccatataggagttccg
cgttacataaacttacggttaaattggcccgctggctgacgcgcccaacgacccccgccattgacgtcaataatgacgtatg
ttcccatagtaacgccaatagggactttccattgacgtcaatgggtggagtatttacggtaaaactgccacttggcagta
catcaagtgtatcatatgccaaagtacgccccctattgacgtcaatgacggtaaatggcccgctggcattatgccagta
catgaccttatgggactttcctacttggcagttacatctacgtatttagtcacgtctattaccatgggtgatggcgttttggc
agtacatcaatgggctggatgacgggtttgactcacggggatttccaagtctccacccattgacgtcaatgggagtttg
ttttggcaccaaaatcaacgggactttccaaaatgtcgtaacaactccgccccattgacgcaaatgggaggtaggcatgt
acgggtgggaggtctatataagcagagctcaataaaagagcccacaacccctcactcggggcgccagtcctccgattgact
gagtcgccccgggtaccggtgtatccaataaacctcttgcagttgcacccgacttgggtctcgtctgttcttgggagg
tctcctctgagtgattgactaccggtcagcggggtctttcatttgggggctcgtccgggatcgggagacccccgtccag
ggaccacggacccaccacgggaggttaagctggcgacgaacttatctgtgtctgtccgattgtctagtgtctatgactga
ttttatgcgcctgcgtcggtactagtttagctaactagctctgtatctggcgacccgtgggtggaactgacgagttcgga
caccggcgccgaacccctgggagacgtcccagggtctcggggggcgtttttgtggcccgacctgagtcacaaaaatccga
tcgttttggactcttgggtgaccccccttagaggagggatgtggttctggtaggagacgagaacctaaaaacgtctcc
cgctccgctctgaatttttgccttgcgtttgggacgaagccgcgcgcgctcttctgtctgtcgcagcatcgttctgtgt
tgtctctgtctgactgtgtttctgtatttgcgtgaaaaatagggcccgggccagactgttaccactcccttaagtttgac
cttaggtcactggaagatgtcgagcggtatcgtcacaaccagtcggtagatgtcaagaagagacgttgggttaccttct
gtctgcagaatggccaacttttaacgtcggtatggcgcgagacggcacctttaaaccgagacctcatcaccaggttaag
atcaagggtcttttcaactggcccgcatggacacccagacaggtccctacatcgtgacctgggaagccttggccttttga
ccccctccctgggtcaagccctttgtacacccctaaagcctccgctcctcttccctccatccgccccctctctcccccctg
aacctcctcgttcgaccccgctcgtatcccttcttaccagccctcactccttctctagggcccccatatggccatat
gagatcttatatggggcaccccccttctgaactccctgacccctgacatgacaagagttactaacagaccctctct
ccaagctcacttacaggtctctacttagtccagcacgaagtctggagacctctggcggcagcctaccaagaacaactgg
accgacgggtggtacctcacccttaccgagtcggcgacacagtggtgggtccgcccagaccagactaagaacctagaacct
cgctggaaaggaccttacacagtcctgctgaccacccccacggccctcaaagtagacggcatcgagcttggatacacgc
cgccacgtgaaggctgcccagccccgggggtggaccatcctctagactgcccGGATCTCGAGGGATCTCCCCAGCATGCC

TGCTATTGTCTTCCCAATCCTCCCCCTTGCTGTCTGCCCCACCCACCCCCCAGAATAGAATGACACCTACTCAGACAA

TGCGATGCAATTTCTCATTTTATTAGGAAAGGACAGTGGGAGTGGCACCTTCCAGGGTCAAGGAAGGCACGGGGGAGGG

GCAAACAACAGATGGCTGGCAACTAGAAGGCACAGTCGAGGtCTAGCTTGCCAAACCTACAGGTGGGGTCTTTTCATTCCC

CCCTTTTCTGAGACTAAATAAAATCTTTTATTTTatcgatagatcccggtcggcatctactctatttcccttggccctcg
gacgagtgctggggcgctcggtttccactatcggcgagttacttctacacagccatcggtccagacggccgcgcttctgcgg
gcgatttgtgtacgccgacagtcgccggtccggatcggacgattgcgtcgcatcgacctgcgcccagctgcacatc
gaaattggcgtcaaccaagctctgatagagttgggtcaagaccaatgcccggagcatatacggccggagccggcgatcctg
caagctccggatgcctccgctcgaagtgcgctgtctgtctccatacaagccaaccacggcctccagaagaagtgttg
gagacctcgtattgggaatccccgaacatcgctcgcctcagtcacgtacgtgttatggggccattgtccgtcaggac
attgttggagccgaaatccgctgcacgaggtgcgggacttccgggagtcctcggcccaagcatcagctcatcgagag
cctgcgcgacggagcactgacggtgtcgtccatcacagtttgcagtgatacacatggggatcagcaatcgcgcatatg
aaatcacgccatgtagtgtattgaccgattccttgggtccggaatggggccgaaccgctcgtctggctaagatcgggcgc
agcgatcgcatccatggcctccgcgacccggtgcagaacagcggggcagttcgggttccaggcaggtcttgcaacgtgacac
cctgtgcacggcgaggatgcaataggtcaggtctcgtctaaattccccaatgtcaagcacttccggaatcgggagcgcg
ggcgatgcaagtgccgataaacataacgatctttgtagaaccatcgggcgagctatttaccgcaggacatatccacg
ccctcctacatcgaaagctgaaagcacgagattcttcgccccccgagagctgcatcaggtcggagacgctgtcgaacttt
cgatcagaaacttctcgacagacgtcgcggtgagttcaggcttttcatgggtattatcatcgtgttttcaaaggaaaac
cacgtccccgtggttcggggggcctagacgttttttaacctcgactaaacacatgtaaagcatgtgcaccgaggccccag
atcagatcccatataatgggggtaccttctgggcatccttcagcccttgttgaatacgttggaggagagccatttgactc
tttccacaactatcccaactcacaacgtggcggtgtgtgcgccttggcaggtgtatcttatacacgtggccttttgg
ccgagaggcacctgtcgccaggtgggggggttcgctgcctgcaaggggtcgctacagacgttggttgtcttcaagaagc
ttCCAGAGGAAGTGCCTTCTTACGACATTCAACAGACCTTGCATTCTTTGGCGAGAGGGGAAAGACCCctagactaga

ccaagctttggatttcatttctgaagtttgaattttctgagtcactagtaatgtccttgaggatgatagttctgaatttct
tctgcaagagtacaaagattggcctttttgagatctttaaataatgtgtcatagcttcttttcttccatgaagttgatg
ccaattacgaagcagttgaactttctgttctgtgtcttggacattgtcattcttctgatctcatctattttggcttcat
tgacaccattctttcgaacaaagcctttaaacttgacttagtgtcatgactccagcaatagtggtgatataatttactcaag

F15-13B

tcaacatcagataaaatttattgcccactgtttcaggatttaaggttgagattcatgagaaccttggttttcccttctgtg
ctttctgcatgttttctgtacttcccttctcttcccccacaaattagtggaattggcaaaagaagaagacaaagccacc
ccaaccggtttccggtcccttccactgagccacggggccgacaatcttctggtctctggggctgagatgtcccggtaggg
tgcacaggtgagggagttcgcagcactggcttggtagtagtagagttcacttctgaaggactggcacgacagaactgaa
gtacatcaccgagttgctgatgactgagcagaaaatagtagccttctgttcttctgtgaactgttcagggtgagaactg
acttattattcgtgtccctcatggcagaaaacagtttcgacgaattcagcttctcgtcccacgttatcttgttggggat
gaagccatatagacaacgaaggtgggctgggggagtttgagctggagttctggaagagccaagagcatccttgcaaac
ggacccaacacttcacataaccaggtccaccttctgaccaagtctggcgctccatcttcttggaaagattcggaggttcgg
gtgctgtggcttagcttctccactccccaggataatcgactcaccagcagcagcaggttcagcgcagaaaagcgggtc
aacggtgaggccatgGTGGCTTTACCAACAGTACCGBAATGCCAAGCTTGCGGCCGCTTAAGAGCTGTAATGAACCTGG

GAGTGGACACCTGTGGAGAGAAAGGCAAAGTGGATGTACAGTAAGACCAATAGGTGCCTATCAGAAACGCAAGAGTCTTCT

CTGTCTCGACAAGCCCAGTTTCTATTGGTCTCCTTAAACCTGTCTTGTAACCTTGATACTTACCTGCCAGTGCCTCAGC

ACCAACTTctgcaggaattcctggacagctcccagatgatcagtaaccgtggttgttatttctgtgcccgggcagtgaggc
ctgggtagggggagctctgcctcagtgctttcagctaaaaatggggtgggaaccccCaggaggcccgggcccctggaa
gttcccttttctctgttcttgggaagtcgattgagcaacacgggggtcaggtgaggtccttccactaccgatgcaca
ccgagtgctGggggaggttctcttctctctcagggcccaacCccagggcccctgcctaggtcccggactctCactcttgac
gcatgctggcttgggtgggtcccagtcagcaaaacttggggtcccgttgcctgggaaagggagaggggtactgggcatcgacg
cctctgcttccacgaagccttgtgaagaaaggtggggggcgttcttgtgcaggagaatgaggcgactgaggtgaactg
gcctcggggGcgcgtgtcccagatgtgtgtgcagggcctcctgatggcgccagccctcgtccctgtgacaaagccttggag
ctggcaccctgagtggtggcctcacCTGTACTACTCCCAGGTCACTGTCTcgcacGCGGCCGCTCGAcgataAAAATAA

AAGATTTTATTAGTCTCCAGAAAAAGGGGGGAATGAAAGACCCACCTGTAGGTTTGGCAAgtagcTTAAGTAACCCA

TTTTGCAAGGCATGAAAAATACATAACTGAGAATAGAGAAGTTCAGATCAAGGTGCGAACAGATGGAACAGGCAATAAA

AGAGCCCAACAACCCCTCACTCGGGGCGCCAGTCTCCGATTGACTGAGTCGCCCCGGGTACCCGTGTATCCAATAAACCCCT

CTTGACAGTTGCATCCGACTTGTGGTCTCGCTGTTCTTGGGAGGGTCTCCTCTGAGTGATTGACTACCCGTGACGGGGG

TCTTTCaactgcaGCATGTATCAAAATTAATTTGGTTTTTTTTCTTAAGTATTTACATTAAATGGCCATagtttcGTAAT

CATGGTCATAGCTGTTTCTGTGTGAAATGTGTATCCGCTCACAATTCACACAACATACGAGCCGGAAGCATAAAGTGT

AAAGCCTGGGGTGCCTAATGAGTGAGCTAACTCACATTAATTCGCTTGCGCTCACTGCCCCGCTTCCAGTCGGGAAACCT

GTGCTGCCAGCTGCATTAATGAATCGGCCAACGCGCGGGGAGAGGCGGTTTTCGCTATTGGGCGCTCTTCCGCTTCTCGC

TCACTGACTCGCTGCGCTCGGTCTCGGCTGCGGCGAGCGGTATCAGCTCACTCAAAGGCGGTAATACGGTTATCCACA

GAATCAGGGGATAACGCAGGAAAGAATGTGAGCAAAAGGCCAGCAAAAGGCCAGGAACCGTAAAAAGGCCGCGTTGCT

GGCGTTTTTCCATAGGCTCCGCCCCCTGACGAGCATCACAAAAATCGACGCTCAAGTCAGAGGTGGCGAAACCCGACAG

GACTATAAAGATACCAGGCGTTTCCCCCTGGAAGCTCCCTCGTGCGCTCTCTGTTCCGACCCCTGCCGCTTACCGGATAC

CTGTCCGCTTTCTCCCTTCGGGAAGCGTGGCGCTTTCTCATAGCTCACGCTGTAGGTATCTCAGTTCGGTGTAGGTCTG

TCGCTCCAAGCTGGGCTGTGTGCACGAACCCCCCGTTACGCCCCAGCGCTGCGCCTTATCCGGTAACATCGTCTTGAGT

CCAACCCGGTAAGACACGACTTATCGCCACTGGCAGCAGCCACTGGTAACAGGATTAGCAGAGCGAGGTATGTAGGCGGT

GCTACAGAGTTCTTGAAGTGGTGGCCTAACTACGGCTACACTAGAAGGACAGTATTTGGTATCTGCGCTCTGCTGAAGCC

AGTTACCTTCGGAAGAGAGTTGGTAGCTCTTGATCCGGCAACAAACCACCGCTGGTAGCGGTGGTTTTTTTGTGTTGCA

AGCAGCAGATTACGCGCAGAAAAAAGGATCTCAAGAAGATCCTTTGATCTTTTCTACGGGTCTGACGCTCAGTGAAC

GAAACTCACGTTAAGGGATTTTGGTCATGAGATTATCAAAAAGGATCTTCACCTAGATCCTTTTAAATTAAAAATGAAG

TTTGCGCAAAATCAATCTAAAGTATATATGAGTAAACTTGGTCTGACAGTTACCAATGCTTAATCAGTGAGGCACCTATCT

CAGCGATCTGTCTATTTCTGTTTCATCCATAGTTGCCTGACTCCCCGTCGTGTAGATAACTACGATACGGGAGGGCTTACCA

TCTGGCCCCAGTGTGCAATGATACCGCGAGACCCACGCTACCGGCTCCAGATTTATCAGCAATAAACCAGCCAGCCGG

AAGGGCCGAGCGCAGAAGTGGTCTGCAACTTTATCCGCTCCATCCAGTCTATTAATTGTTGCCGGAAGCTAGAGTAA

GTAAGTTCGCCAGTTAATAGTTTGGCGAACGTTGTTGCCATTGCTACAGGCATCGTGGTGTACGCTCGTCTTGGTATG

2025 06 24 15:00

Figure 1. The location of the study area in the north-eastern part of the Adriatic Sea. The map shows the coastline of the Adriatic Sea with the location of the study area marked by a rectangle. The map also shows the location of the study area in the Adriatic Sea, with the location of the study area marked by a rectangle. The map also shows the location of the study area in the Adriatic Sea, with the location of the study area marked by a rectangle.

GCTTCATT CAGCTCCGGT TCCCAACGATCAAGGCGAGTTACATGATCCCCCATGTTGTGCAAAAAAGCGGTTAGCTCCTT
CGGTCCCTCCGATCGTTGTCAGAAGTAAGTTGGCCGAGTGTTATCACTCATGGTTATGGCAGCACTGCATAATTCTCTTA
CTGTCATGCCATCCGTAAGATGCTTTTCTGTGACTGGTGagtactcaaccaagtcattctgagaatagtgtatgcggcga
ccgagttgctcttgccccggcgtaacacgaggataataccgcgccacatagcagaactttaaaagtgtcatcattggaaa
acgttcttcggggcgaaaactctcaaggatcttaccgctggtgagatccagttcgatgtaacccactcgtgcacccaact
gacttcagcatcttttactttcaccagcgtttctgggtgagcaaaaacaggaaggcaaaatgccgcaaaaaagggaata
aggcgacacggaaatgttgaaatactcatactcttcctttttcaatattattgaagcatttatcagggttattgtctcat
gacattaacctataaaaaataggcgt